

A SEMI-ANNUAL AQUATIC MONITORING REPORT FOR A SURFACE MINE PERMIT (DMLR # 1101760) LOCATED NEAR ROARING FORK IN WISE COUNTY, VIRGINIA

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ATS PROJECT NO. 1199.01

I. INTRODUCTION

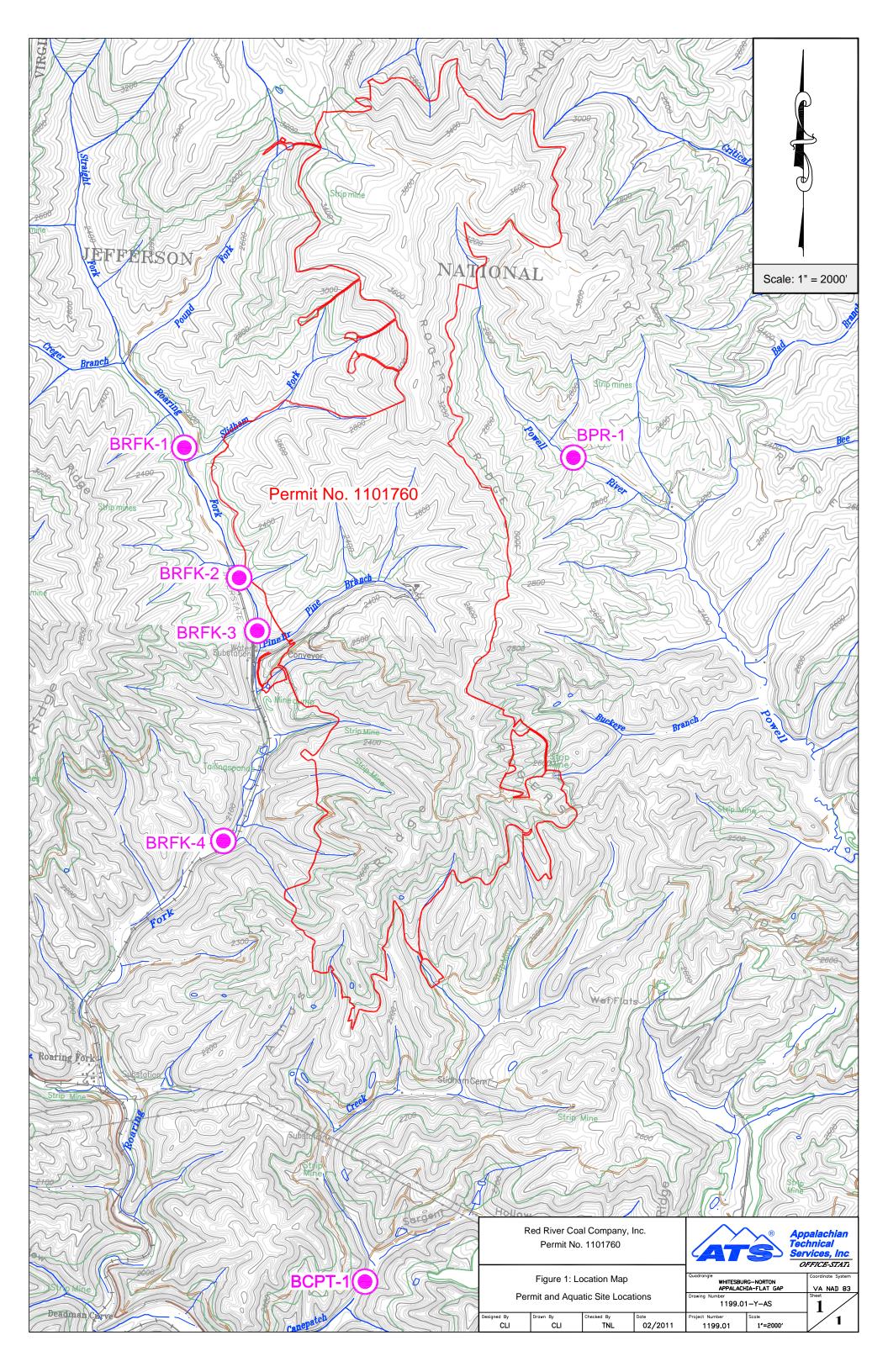
Appalachian Technical Services, Inc. was contracted by Red River Coal Company, Inc to conduct ongoing semi-annual (spring and spring) aquatic monitoring at six sites near Roaring Fork in Wise County, Virginia. This report represents the spring 2013 aquatic biological assessments of six sample sites. The permit boundary and sample site locations are shown on the attached topographical map in Figure 1.

II. METHODS

General locations of all sample sites were selected by a Virginia DMLR biologist. However, the exact site locations may have been relocated by ATS senior biologists due to site conditions (*i.e.* low flow, lack of riffle habitat, etc.) and accessibility. Aquatic sampling site BRFK-1 was located on Roaring Fork approximately 50 m upstream of the confluence with Stidham Fork (37.01197; 82.72942). Aquatic sampling site BRFK-2 was located on Roaring Fork approximately 400 m upstream of sample site BFRK-3 (37.00593; 82.72570). Aquatic sampling site BRFK-3 was located on Roaring Fork approximately 50 m upstream of the confluence to Pine Branch (37.99998; 82.72245). Aquatic sampling site BRFK-4 was located southeast of the permit on Roaring Fork approximately 450 m downstream of a series of sediment ponds (39.98559; 82.72422). Aquatic sampling site BCPT-1 was southeast of the permit and located on Canepatch Creek approximately 100 m downstream of the confluence to Sargent Hollow (36.95642; 82.71047). Aquatic sampling site BPR-1 was located to the east of the permit boundary in the upper headwaters of the Powell River approximately 50 m upstream of Red River Coal Company's haulroad (37.01273; 82.69593).

Data collections for the aquatic monitoring consisting of habitat data, macroinvertebrates, grab samples and physiochemical water quality data were collected on 14 and 16 May 2013 by ATS Biological Technicians James Breeding and Joseph Day.





A. Habitat Assessments

Rapid Bioassessment Protocol (RBP) high gradient data sheets were used to assess the habitat for each stream. The RBP sheets score each site's habitat based on 10 criteria with 1 - 20 possible points each (for a max total of 200). Based on the 2008 Methods for Assessing Biological Integrity of Surface Waters in Kentucky, Revision 3 (KDOW 2008), stream habitat in the central Appalachians Ecoregion is considered not supporting its designated use if the total score is less than or equal to 116 total points. Habitat must score 117 – 159 to achieve a partially supporting criterion. To qualify as fully supporting habitat, it must score at least 160 total points. Copies of the stream habitat data sheets are attached in Appendix A.

B. Aquatic Macroinvertebrates

Macroinvertebrates were collected using the single habitat approach as described in sections 7.1.1 and 7.3.1 of the *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition* (Barbour *et al.* 1999).

Macroinvertebrates were collected by agitating a riffle area of 0.25 meters in front of a standard size (500 Φ m mesh) kicknet. This process was repeated eight times to achieve 2 square meters of sample area. Upon collection, samples from each site were placed in individual containers of 95% ethyl alcohol, labeled, and returned to the lab.

Subsampling procedures followed methods within Appalachian Technical Services, Inc.'s Virginia Department of Environmental Quality approved Quality Assurance Project Plan for Biological Monitoring, 2010 and resulted in the identification of approximately 110 (±10%) individuals. All macroinvertebrates were identified by a North American Benthological Society certified taxonomist to family level with the exception of Chironomidae and Oligochaeta.

Macroinvertebrate metrics were calculated based on the methods included in A



Stream Condition Index for Virginia Non-Coastal Streams (Tetra Tech, Inc. 2003). ATS biologists used the Ecological Data Application System (EDAS) to statistically rarify the samples to 110 organisms and calculate VSCI scores. The VSCI is used to compare streams to reference conditions to evaluate a streams current health. A stream must score a 61 or above to qualify as acceptable water quality. In order to calculate the VSCI the following metrics were calculated from the family level aquatic macroinvertebrate data: Taxa richness; Ephemeroptera, Plecoptera, Trichoptera (EPT) Index: Percent Ephemeroptera; Percent Plecoptera Trichoptera (less Hydropsychidae); Percent Scrapers; Percent Chironomidae; Percent of top two dominant families; and Family Biotic Index (FBI). Tables with the macroinvertebrate data are attached in Appendix B.

C. Physiochemical Water Data

Prior to any field data collections, all handheld meters were calibrated. Four water quality parameters (specific conductance, dissolved oxygen, pH, and temperature) were analyzed using a handheld meter (YSI Pro Plus). Upon return to the lab all meters received a post-calibration check to ensure validity of all measurements recorded.

In addition to handheld meters, a surface water grab sample was collected at each sample site and delivered to Environmental Monitoring Inc. for analysis. Parameters analyzed were Acidity, Alkalinity (Bicarbonate), Alkalinity (Carbonate), Total Alkalinity, Hardness, Total Iron, Total Manganese, Nitrate, Nitrite, Total Cyanide, Total Dissolved Solids, Total Phenols, Total Suspended Solids, Total Boron, Total Magnesium, Total Aluminum, Total Antimony, Total Arsenic, Total Barium, Total Beryllium, Total Cadmium, Total Chromium, Total Cobalt, Total Copper, Total Lead, Total Nickel, Total Selenium, Total Silver, Total Thallium, Total Zinc, Total Mercury, Chloride, Sulfate, and Dissolved Organic Carbon. Grab sample analysis data can be found in Appendix C.



III. RESULTS

A. Habitat Assessments

The stream habitat at BRFK-1 scored 141 of 200 (Appendix A), indicating the habitat is partially supporting its designated use. The stream was approximately 15 feet wide and characterized mostly by a series of riffles and runs (Figures 2 and 3). Flow occupied >75% of the stream channel. Embeddedness was suboptimal with approximately 25 to 50% of the substrate particles surrounded by fine sediment. The water was clear but there was slight deposition of sediment within the streambed. The stream banks were moderately stable and with good riparian zones.

The stream habitat at BRFK-2 scored 129 of 200 (Appendix A), indicating the habitat is partially supporting its designated use. The stream was approximately 15 feet wide and characterized mostly by a series of riffles and runs (Figures 4 and 5). Flow occupied >75% of the stream channel. Embeddedness was suboptimal with 25 to 50% of the substrate particles surrounded by fine sediment. The water was clear but there was slight to moderate deposition of sediment within the streambed. The stream banks were moderately stable but the right bank had a narrow riparian zone.

The stream habitat at BRFK-3 scored 130 of 200 (Appendix A), indicating the habitat is partially supporting its designated use. The stream was approximately 15 feet wide and characterized mostly by a series of riffles and runs (Figures 6 and 7). Flow occupied >75% of the stream channel. Embeddedness was suboptimal with 25 to 50% of the substrate particles surrounded by fine sediment. The coloration of the water was clear and there was slight to moderate deposition of sediment within the streambed. The stream banks were moderately stable but the right bank had a narrow riparian zone.

The stream habitat at BRFK-4 scored 137 of 200 (Appendix A), indicating the habitat is partially supporting its designated use. The stream was approximately 15 feet wide and characterized mostly by a series of riffles and runs (Figures 8 and 9). Flow



occupied >75% of the stream channel. Embeddedness was suboptimal with approximately 25 to 50% of the substrate particles surrounded by fine sediment. The coloration of the water was clear but there was evidence of slight to moderate sedimentation within the streambed. Both stream banks were stable and good with riparian zones.

The stream habitat at BCPT-1 scored 125 of 200 (Appendix A), indicating the habitat is partially supporting its designated use. The stream was approximately 12 feet wide and characterized mostly by a series of riffles and runs (Figures 10 and 11). Flow occupied >75% of the stream channel. Embeddedness was suboptimal with 25 to 50% of the substrate particles surrounded by fine sediment. The coloration of the water was clear but there was evidence of moderate sedimentation within the streambed. The stream banks were somewhat stable but the right bank had a narrow riparian zone.

The stream habitat at BPR-1 scored 133 of 200 (Appendix A), indicating the habitat is partially supporting its designated use. The stream was approximately 6 feet wide and characterized mostly by a series of mostly riffles (Figures 12 and 13). Flow occupied >75% of the stream channel. Embeddedness was suboptimal with approximately 25 to 50% of the substrate particles surrounded by fine sediment. The coloration of the water was clear but there was evidence of moderate deposition of sediment within the streambed. The stream banks were stable and with good riparian areas.

B. Macroinvertebrates

Sample site BPR-1 had the highest Taxa and highest EPT Richness (Tables 1 and 2). Sample site BPR-1 had the lowest FBI score (2.5) indicating excellent water quality with organic pollution unlikely (Table 2). VSCI scores for the six aquatic sample sites ranged from a low of 23.61 (BRFK-1) to a high of 55.16 (BPR-1) (Table 2).



C. Physiochemical Water Data

All handheld meters passed post-calibration tests except for the specific conductance records at sample sites BRFK-1, BRFK-3 and BRFK-4. Specific conductances for the six sites ranged from 823 μ S (BPR-1) to 1319 μ S (BRFK-2) (Table 3). All other parameters recorded were within normal limits. The results of the water chemistry grab samples for each site are attached in Appendix C.

IV. CONCLUSION

Based on RBP habitat data, all six sample sites appear to be somewhat impaired. Habitat assessments revealed that the habitat was marginal to suboptimal at all six sample sites. Five of the six sample sites had a VSCI score below the unimpaired threshold of 61. Only sample site BPR1 had a VSCI score above the unimpairment threshold of 61. All the sample sites had low; Taxa Richness, EPT Richness, percent Ephemeroptera, percent PT-Hydropsychidae, percent scrapers, and high percent two dominants. All water parameters recorded with a handheld meter were within normal limits with an exception of elevated specific conductances.





Figure 2: BRFK-1 upstream view



Figure 3: BRFK-1 downstream view





Figure 4: BRFK-2 upstream view



Figure 5: BRFK-2 downstream view





Figure 6: BRFK-3 upstream view



Figure 7: BRFK-3 downstream view





Figure 8: BRFK-4 upstream view



Figure 9: BRFK-4 downstream view





Figure 10: BCPT-1 upstream view



Figure 11: BCPT-1 downstream view





Figure 12: BPR-1 upstream view



Figure 13: BPR-1 downstream view



Literature Cited

- Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.
- Kentucky Division of Water (KDOW), 2008. Methods for assessing biological integrity of surface waters in Kentucky, Revision 3. Kentucky Department of Environmental Protection, Division of Water, Frankfort, Kentucky.
- Tetra Tech, Inc. 2003. A Stream Condition Index for Virginia Non-Coastal Streams. Tetra Tech, Inc. Owings Mills, Maryland. Prepared for Virginia Department of Environmental Quality, Richmond, Virginia.



APPENDIX A:

RBP DATA



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SCORE RB to 9

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Poor 4. Sediment Optimal Suboplimal Marginal Heavy deposits of fine Deposition Little or no enlargement Some new increase in Moderate deposition of of Islands or point bars and less than 5% (<20% bar formation, mostly new gravel, sand or fine sediment on old and material, increased bar development; more than from gravel, sand or fine sediment, 5-30% (20-50% for low-gradient) of nevy bars; 30-50% (50-50% (80% for lowfor I; ow-gradient gradient) of the bottom streams) of the bottom 80% for low-gradient) of changing frequently; affected by sediment the bottom affected; pools almost absent, deposition. slight deposition in SCORE pools. 20 19 18 17 16 15 14 13 12 11 9 8 7 5 4 3 2 1 m/s. Marginal Optimal Suboptimal Poor' Very lillle water in 5, Channel Flow Water reaches base of Water fills >75% of the Water fills 25-75% of the channel and mostly avallable channel, Status both lower banks, and available channel; or present as slanding and/or riffle substrates minimal amount of 25% of channel pools. channel substrate is. substrate is exposed. are mostly exposed. exposed. 5 4 3 2 1 SCORE 20 19 18 17 16 . 15 14 13 12 11 10 9 8 7 6 Poor Hanks shored with 6, Channel Alteration Öptimal Suboptimal Marginal Some channelization Channelization may be Channélization or gablon or cement over extensive; embankments dredging absent or present, usually in areas 80% of the stream reach or shoring structures minimal; stream with of bridge abutements; channelized and present on both banks; normal patter. evidence of past and 40 - 80% of stream disrupted. Instream channelization, i.e., habitat greatly aftered or reach channelized and dredging, (greater than removed entirely. past 20 yr.) may be disrupted. present, but recent channelization is not present. 5 4 3 2 1 SCORE 20 19 18 17 16 15 14 13 12 41 10 9 8 7 Optimal Poor 7. Frequency of Riffles Subonlimal Marginal Generally all flat water Occurrence of rifiles Occasional rifile or (or bends) Occurrence of riffles or shallow riffles; poor relatively frequent ratio Infrequent; distance bend; bollom confours habitat; distance biw. of distance blw. riffled btw. riffles divided by provide saomo habital; riffles dividled by the divided by width of the the width of the stream distance btw. riffles width of the stream is a divided by the width of sfream <7:1 *generally 5 Is btw. 7 to 15. to 7); variety of habitats the stream is blw. 15 to ration of >25%. If key. In streams where riffles are continuous, 25. placement of boulders or other large, natural obstruction is important. 4 3 2 1 15 14 13 12 11 10 9 8 7 6 SCORE 20 19 18 17 16 8. Bank Stability Optimal Suboptimal Marginal Poor Moderately unstable, 30-Unslable; many eroded (score each bank) Banks stable; evidence Moderately stable; of eroston or bank Infrequent, small areas 60% of bank in reach areas "raw" areas of eroslon mostly has areas of erosion; failure absent or minimal; little potential healed over 5-30% of high erosion potential bank in reach has areas during floods. for future problems. < 5% of bank affected. of eroslon. SCORE RE 10 9 8 7 G 2 1 6 B 7 5 4 2 1 0 SCORELB 10 9 G 3 9. Vegetative Suboptimal Marginal Poor Optimal Protection (score each More than 90% of the Less than 50% of the 70-90% of stream bank 50-70% of the stream stream bank surfaces banki stream bank surfaces surfaces covered by bank surfaces covered nativa vegelation, but by vegetation; covered by vegetation; and immediate riparian disruption of stream zone covered by native one class of plants is disruption obvious; bank vegetation is very not well-represented; patches of bare soll or vegetation, including high; vegetation has frees, understory disruption evident but closely cropped shrubs, or non-woody macrophyles; vegetative been removed to 5 cm not affecting full plant vegelation common; or less in average less then one-half of the growth potential to any stubble height. disruption through great extent; more than potential plant stuibble grazing or mowing one-half of the potential height remaining. minimal or not evident; plant slubble helght almost all plants remaining. allowed to grow naturally. 8 7 B 8 7 6 SCORE RB 10 3 2 .1 0 9 1 SCORE LB 10 5 9 10. Riparian Suboptimal Marginal Poor Optimal Vegetative Zone Width Width of riparlan zone Width of riparian zone Width if riparianzone Width of riparian zone 6-12 m; human activite id (score each bank) 12-18 m; human activites <6 m; Iltila or no >18 m; human activities have impacted zone a riparian yegetation due (I.e. parking lots, have impacted zone to human activities. roadbaeds, clear-cuts, only minimally. great deal. lawns, or crops) have not impacted zone.

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	0/ // /5	1199.01-BBFK3	Benthic Macroli	nvertebrate	e Field Data Sh	leet (front) Land: Use	
_	Station ID:	1	. Ecoregion:	2- Maril	a) n	Start Time: 10:00	
	Fleld Team:			Bis. Monito	Committee of the Commit		
	Sfream Name	Roaning Fork	_ Location: Ac	florent to	ald cake over	rs Finish Time: 6:25	
•	Date: Stream P	5 <u>/6 /13</u> hysicochemical	Letitude; 36.99	9998	Longilude:	32.12245	
	Instrument IE Temperature: Dissolved Ox	: 15.2 Ca		ument pass all	us/cm post-calibration ch		
				Which paramet	er(s) failed and acti	on	
		acroinvertebrate Col					
	Method used Riffle Quality Habitats samp # Jat	(circle one) leci (circle one)	Single Habital (Rijie) Good Marginal Rifile Snays	Poor Banks	Multi Habi Nona Vägelation	(at (Legs, plants, etc) Area Sampled (sq. m.):	m²
F	Current Wealise Recent precipits Stream flow INS		Normal LOCAL WATERS		Storms Oti nal Flood EES:	rer ,	
	Ranj Ave Disc	am Width 15 ft ge of Depth 1.0 ft rage Velocity ft/s harge cs		iding Dand Oses	Construction Commercial Industrial Row Crops	O Forest O Pasture/Grazing O Silviculture O Urban Runofi/Storm Sewers	i
	θDa	aulio Structures: uns	<u>Síream</u> 9 Dry 9 High	0 Pooled	8 Low 9 Normal For Torrential	Stream Type: Perennial Of Intermittent DEplanmeral Of Seep	_
	Domi O Tree O Gra	male Type: Sycam	Partial Partial OFully E	Cover: Shaded (75-100 lly Shaded (50-7 lly Exposed (25- xposed (0-25%)	%) 9 Dredgi (5%) 9 Channe (9Full 9P	lization	
	Substa	rate 0Est. 0P.C.	RIFFIG 70 %	0.000000	30 %	Pool%	-
		tayorablo for epifauna colonization and fish covered to fish so fisher and fish covered to fish of snags, submerged logs, undereut banks, color of other stable that fisher and allow full colonization following fisher and not new fall and not fransent).	adequate habitation maintenance of populat at presence of additional that substrate in the format fall, but not yet prepared collocation (may rate at end of scale).	Me habilat; 20-40; habilat avallabi destana frequen or remo- new d for high	arginal Kimix of stable ; habifat f lity less than e; sbustrate ty yed,	Poor Less than 20% stable ablitat, lack of habitat is obylous; substrate instable or lacking.	
2 5		ORE 20 19 18 17 16	15 (4) 13 12 11			4 3 2 1	
e, el	mbeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment, Layering of	Suboptimel Gravel, cobble, and boulder particles are: 50% surrounded by fit sediment.	Gravel, c 25- houlder p	earticles are 50- bo bunded by fine mo suit	Poor ayel, cobbie, and ulder partices are ure ingin 75% rounded by line liment.	
		cobble provides diversily of niche space		141000		•	
3. Vel Regin	locity/Depth	ORE 20 19 18 17 16 Optimal' CoverAll four' velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow), Slow is	15 14 (13 /12 11 Suboptimal Only 3 of the 4 regimes present (if fast shallow is missing, score lower than if missing other regimes).	regimes pr stallow or	inal he4habitat Dor resent(iffast- yeo	4 3 2 1 Poor Intended by 1 City/depth regime Inally slow-deep).	
	. sco	<0.3 m/s, deep is >0.5 RE 20 19 18 17 16	15 14 13 12 11	(10) 9 8	7 6 5	4 3 2 1	

SCORE RB 10 9

SCORELB 10 (9

4. Sedinjent Optimal Suhoplimal Poor Marginal Deposition Some new increase in Heavy deposits of fine Little or no enlargement Moderate deposition of material, increased bar new gravel, sand or fine sediment on old and of Islands or point bars bar formation, mostly development; more than 50% (80% for lowand less than 5% (<20% from gravel, sand or new bars; 30-50% (50for I; ow-gradient fine sediment. 5-30% (20gradient) of the bottom streams) of the bottom 50% for low-gradlent) of 80% for low-gradient) of affected by sediment the bottom affected; changing frequently; slight deposition in pools almost absent, deposition. SCORE pools. 20 19 18 17 16 15 14 13 12 (11) 10 9 8 7 5 4 3 2 1 mis. Optimal Marginal Poor Suboptimal Water fills 25-75% of the Water fills >75% of the Very liltle water in 5, Channel Flow Water reaches base of Status both lower banks, and available channel; or available channel, channel and mostly minimal amount of 25% of channel andlor riffle substrates present as slanding pools. channel substrate is. substrate is exposed. are mostly exposed. exposed. SCORE 20 19 18 17 16 : (15) 14 13 12 11 9 8 7 5 4 3 2 1 Poor Banks shored with 6. Channel Alteration **Oplimal** Suboptimal Marginal Channelization or Some channelization Channelization may be dredging absent or present, usually in areas extensive; embankments gabion or cement over minimal; stream with of bridge abutements; or shoring structures 80% of the stream reach channelized and normal patter. evidence of past present on both banks; disrupted. Instream channelization, i.e., and 40 - 80% of stream habitat greatly aftered or dredging, (greater than reach channelized and past 20 yr.) may be disrupted. removed entirely. present, but recent channelization is not present. SCORE 20 19 18 17 16 15 14 13 12 (11) 10 9 8 7 5 4 3 2 1 Optimal Suboplimal 7. Frequency of Riffles Marginal Poor Generally all flat water (or bends) Occurrence of riffles Occurrence of rifiles Occasional riflle or relatively frequent ratio Infrequent; distance bend; bollom confours or shallow riffles; poor of distance blw. riffled bty, riffles divided by provide saomo habital; habitat; distance btw. divided by width of the the width of the stream distance btw. riffles riffles dividied by the stream <7:1 *generally 5 divided by the width of width of the stream is a Is btw. 7 to 15. to 7); variety of habitats the stream is blw. 15 to ration of >25%. If key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. 4 3 2 1 15 (14) 13 12 11 10 9 8 7 6 SCORE 20 19 18 17 16 8. Bank Stability Poor Suboptimal Marginal Optimal (score each bank) Banks stable; evidence Moderately stable; Moderately unstable, 30-Unslable; many eroded of erosion or bank Infrequent, small areas 60% of bank in reach areas "raw" areas has areas of erosion; failure absent or of croslon mostly minimal; little potential healed over, 5-30% of high erosion potential bank in reach has areas during floods. for future problems. < 5% of bank affected. of eroslon. SCORE RB 10 9 7 G 5 4 2 1 5 4 SCORE LB 10 9 8 7 G 3 2 1 0 9. Vegetative Optimal Suboptimal Marginal Poor Protection (score each More than 90% of the 50-70% of the stream Less than 50% of the 70-90% of stream bank banki stream bank surfaces bank surfaces covered stream bank surfaces surfaces covered by nativa vegelation, but by vegetation; covered by vegetation; and immediate riparian zona covered by native one class of plants is disruption obvious; disruption of stream vegetation, including frees, understory not well-represented; patches of bare soll or bank vegetation is very disruption evident but closely cropped high; vegetation has shrubs, of non-woody macrophyles; vegetative disruption through not affecting full plant vegelation common; been removed to 5 cm growth potential to any less then one-half of the or less in average great extent; more than potential plant stuibble slubble height. grazing or mowing one-half of the potential height remaining. minimal of not evident; plant slubble helght almost all plants remaining. allowed to grow naturally. SCORE RE 10 6 2 0 5 3 1 9 7 SCORE LB 10 8 7 4 3 2 1 9 п 10. Riparian Optimal Suboptimal Marginal Poor Vegetative Zone Width Width of riparlan zone Width If riparianzone Width of riparian zone Width of riparlan zone (score each bank) 6-12 m; human activite id <6 m; Iltile or no >18 m; human activities 12-18 m; human activites riparian yegetation due (Le, parking lots, have impacted zone have impacted zone a roadbaeds, clear-cuts, only minimally. great deal. to human activities. lawns, or crops) have not impacted zone.

3

5 4

5 4

7 6

7 6

2

-1

Station ID:	1199.01-BRFK4	Benthic Macro	invertebrate Fie	eld Data Shee	í (front) Land: Use	
Fleld Team:	JEB JUD	Survey Reason:	Bio. Monitor	civoa	Start Time: 9:15	•
Sfream Name:	Boaring Fork		om down street	The second secon	Finish Times 9:45	4
	hodring 1015		unnomed tribute	m ot	Fillian time:	
. Date:	5/14/15	Latitude: 36.	98559 Lor	nglfude; 82	12442	
Stream Phy	sicochemical				·	
Instrument ID nu	Imber: VSI-PRO	рН:	8.29	***		
Temperature: Dissolved Oxyge	14.7 Ca	Conduc	livity: 54.9 u	S/cnt		
DISSOIVER OXYGE	en: <u>12:95</u> mg/l	Did inst	rument pass all post which parameter(s)	-calibration checks	37 Y/N	
Danatat an			milon parameter(e)	falled and action_	t-mp-	
Benthic Mac	roinvertebrate Colle					
Method used Riffle Quality	(circle one) Sir. (circle one) Go	igle Habitat iRille	70	Multi Habitat	(Logs, plants, etc)	
Habitats sampled	(circle one) Rif			Nona Vegelation	Area Sampled (sq.m.):	
#Jabs	. —	- '			2	MS
Weather Obs	ervations					****
Current Weather	(circle one) Clott	dy Clear	Rajn/Snow	Foggy		
Recent precipitation Stream flow (cir		Showers		rms Officer		
	cle one) Low EAM WATERSHED	Normal	Above Normal	Flood		
FEATU	RES:		HED FEATUREES;		*	
Stream		Predominant Surrou			III - Proposition Controller	
Range o	f Depth Z. oft Velocity ft/s	Surface MiningDeep Mining		onstruction onmercial	Forest Posture / Creation	
Discharg	gecfs	Oil Wells		Iustrial	Pasture/Grazing Silviculture	
Est, Read	ch Length 100m	O Land Disposal	O Ro	w Crops	O Urban Runoff/Storm Sewers	
Hydraulio	o Structures:	Stream	Flow:		Stream Type:	
	0 Bridge Abutments	θ Dry	0 Pooled 0 Low		Perennial O Intermittent	
e Island e Other	0 Waterfalls	θ High	0 Very Rapid or To	orrential	0 Éphemeral 0 Séep	
	Vegelation: Doin. Tree/S	бинь Таха Сапору	Cover:	Channel After	ations.	
Dominale	Type: Sycomore	Ø Fully	Shaded (75-100%)	9 Dredging		
O Trees O Grasses	O Herbaceous Rutumoliv		lly Shaded (50-75%) lly Exposed (25-50%)	θ Channelizatio	011	
Number of		OFully I	xposed (0-25%)	(0Full 0Partial))	
Substrate	0Est. 0P.C. R	iffic 600 %	Run 38	%	Pool 5 %	
The state of the s	The charter of the ch		abitat Data Sheet	Company of a second sec		
1. Epifaunal	Optimal	Suboptimal	Marginal		Poor	
Substrate/Available	Grealer then 70% of substrate favorable for epifatina	40-70% mis of stable in Well suited for full	abilat; 20-40% mix o	fstable Less	ihan 20% stable	
Cover	colonization and fish cover:	colonization potential;	habitat; habita avallability less		f, lack of habifat is us; substrate	
	mix of snags, submerged logs, undercut banks, cobble	adequate habitat for maintenance of populat	destrable; shus	strate unstat	ole or lacking.	
	or other stable habitet and at	presence of additional	or removed.	nped		
	slage to allow full colonization polential (i.e. logs/snage that are not new fall and not	substrate in the form of fall, but not yet prepared	new for			
	are not new fall and not franisent).r	colinzation (may rate at l end of scale).	algh			
SCORE		15 🚯 13 12 11	10 9 8 7	6 5 4	3 2 1	
2. Embeddedness	Optimal	Suboptimal Gravel, cobble, and	Marginal Gravel cabble		oor	
	boulder particles are 0-	oulder parlicles are:		are 50- boulder	cobble, and partites are	
		50% surrounded by fir sediment.	sediment.		in 75% led by fine	
29	cobble provides diversity of niche space,	0.00 M		sedfment		
SCORE		5 14 13 12 11	10 9 8 7	6 5 4 3	2 1	
3. Velocity/Depth	Optimal'	Suboptimal	Marginal	Po		
		nly 3 of the 4 regimes resent (if fast shallow				
Ì	present (slow-deep, is	missing, score lower		nallow (usually s	epth regima low-deep).	
		an If missing other gimes).	are missing, score			
•	<0.3 m/s, deep is >0.5	_				
SCORE 2	20 19 18 17 16 15	14 13 12 (1)	10 9 8 7 6	5 4 3	2 1	

Little or no enlargement

of Islands or point bars

and less than 5% (<20%

streams) of the bottom

affected by sediment

20 19 18 17 16

Water reaches base of

both lower banks, and

relatively frequent ratio

sfream <7:1 *generally 5

to 7): variety of habitats If key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.

channel substrate is.

1199.01-BRF	K4
'4. Sediment Deposition	Optimal Little or no enlarg of Islands or poin and less than 5% for I; ow-gradient streams) of the bo affected by sedime deposition.
SCO	
	. 20 19 18 17 . m/s. Optimal
5, Channel Flew Status	Water reaches base hoth lower banks, a minimal amount of channel substrate is exposed.
SCOR 6, Channel Alteration	
SCORE 7. Frequency of Riffles (or bends)	20 19 18 17 16 Optimal Occurrence of riffics relatively frequent ration of distance blw. riffied
	divided by width of the stream <7:1 *generally to 7); variety of habitat if key. In streams when tilles are continuous, placement of boulders

SCORE 20 19 18 17 16 8. Bank Stability Optimal (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential forfulure problems. < 5% of bank affected. SCORE RB 10 SCORELB 10 9 Optimal Protection (score each More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including frees, understory shrubs, or non-woody macrophyles; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow

naturally. SCORE RB 10 9 SCORE LB 10 Optimal

Vegetative Zone Width Width of riparlan zorne (i.e. parking lots, roadbaeds, clear-cuts, lawns, or crops) have not impacted zone.

(score each bank) >18 m; human activities

Suhoplimal Some new increase in bar formation, mostly from gravel, sand or fine sediment. 5-30% (20-50% for low-gradlent) of the bottom affected; slight deposition in pools.

15 14 13 12 1 10 9 8 7 Suboptimal Marginal Water fills >75% of the Water fills 25-75% of the available channel; or available channel, andlor riffle substrates 25% of channel substrate is exposed. are mostly exposed. 10 9 8 7 6

Marginal

Moderate deposition of

new gravel, sand or fine sediment on old and

new bars; 30-50% (50-

Marginal

Channelization may be

present on both banks;

and 40 - 80% of stream

reach channelized and

disrupted.

10 9 8 7

Marginal

Occasional riflle or

distance btw. riffles

9 8 7 6

bend; bottom confours

provide saomo habital;

divided by the width of

the stream is blw. 15 to

extensive; embankments or shoring structures

80% for low-gradient) of

CORE 20 19 18 17 16 . (45) 14 13 12 11 Suboptimal Some channelization present, usually in areas of bridge abutements; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.

15 14 13 12 11 Suboplimal Occurrence of rifiles Infrequent; distance btw. riffles divided by the width of the stream Is btw. 7 to 15.

15 14 13 12 11

of croston.

Suboptimal

70-90% of stream bank

surfaces covered by

native vegelation, but

one class of plants is

not well-represented; disruption evident but

not affecting full plant

growth potential to any

great extent; more than

one-half of the potential

plant slubble height

Width of riparian zone

have impacted zone

12-18 m; human activites

remaining.

7 6

7

Suboptimal

only minimally.

7 6

7

B 7 G

80 7 G

Suboptimal Marginal Moderately unstable, 30-Moderately stable; 60% of bank in reach Infrequent, small areas of croslon mostly has areas of erosion; healed over, 5-30% of high erosion potential bank in reach has areas during floods. 5 4 5 4 3

Marginal 50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegelation common; less then one-half of the potential plant stuibble height remaining.

4

Marginal

great deal.

5 4

2 2 Poor Width if riparian zone Width of riparian zone <6 m; Iltila or no 6-12 m; human activite id riparian yegetation due have impacted zone a to human activities.

Poor Heavy deposits of fine material, increased bar development; irlore than 50% (80% for lowgradient) of the bottom changing frequently; pools almost absent.

Poor Very lillle water in channel and mostly present as slanding pools.

5 4 3 2 1

5 4 3 2 1 Poor Banks shored with gablon or cement over 80% of the stream reach channelized and disrupted. Instream habitat greatly aftered or removed entirely,

5 4 3 2 1 Poor Generally all flat water or shallow riffles; poor habitat; distance biw. riffles dividied by the width of the stream is a ration of >25%.

3 2 1 Poor Unslable; many eroded areas "raw" areas

(1

0

2

2 1

Poor

4

Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has: been removed to 5 cm or less in average slubble height. 0 .1 1

5 4 3 1 5 4 2 1

9. Vegetative

bankj

10. Riparian

	1100 0007	Benthic Mac	roinvertebrat	e Fleld Data			
Station ID:	1199.01- BCPTI	. Ecoregion:	2	1		and: Use	9.15
Fleld Team:	JEB. JUN	Survey Reason:	Bio. Moni		-	Hart Time;	8.25
Stream Name:	Caneputen Grack	_ Location:	100m down :	strain of U	innounce t	inis ri time:	9:55
Date: Stream Phy	5 <u>/14/13</u> sicochemical	Latitude; 36	. 95642	Longliude:	82.	71047	ı
Instrument ID nu			0.55	niemes ,			
Temperature: Dissolved Oxyge	16.1 Ca	Cond Did i	luctivity: 25 nstrument pass a D-which parame	us/ont Il post-calibratio ter(s) failed and	n checks? I action	Y/N	C. R. pin Section 1
Benthic Mac	roinvertebrate Coll	ection ·				-31	
Method used			Rittle)	Multi	Habitat	(Loge, plants, o	ilo)
Riffle Quality Habitats sampled # Jabs		ood Margli ifile Snags		None Vegelation	n	Area Sample	1 (sq.m.): 2m²
	(clicia one) Gio n (clicie one) Gio rote one) Low EAM WATERSHED JRES:	Normal LOCAL WATE	Rajn/Spo Rajn Above No RSHED FEATUR rounding Land Use	Storms rmal FI REES:	Officer		
Average Dischar	Popul 1.5 ft Welecity flys	O Surface Mining	-	9 Construction 9 Commercial 9 Industrial 9 Row Crops	(D Forest D Pasture/Grazir D Silviculture D Urban Runoff/	
0 Dams	io <u>Structures:</u>	<u>Stre</u> 9 D 9 H		8 Low 9 Norid or Torrential	rmal (Stream Type: Perennial 0 N 0 Ephemeral	
Riparian Dominal Trees 6 Grasses		S OF	opy Cover: ully Shaded (75-10 artially Shaded (50 artially Exposed (2: lly Exposed (0-25%	0%) θ D -75%) θ C1 5-50%) (θFι	nnel Altera redging rannelizațio rli OPartial)	n	
Substrate	e OEst. OP.C.	Riffle 60 %	Ru	m 40 %		Pool_O	_%
1. Epifaunal Substrate/Available Cover	Optimal Greater then 70% of subsite favorable for epifatina colonization and fish cover mix of snage, submerged logs, undercut banks, cobbor of ther stable habitat and stage to allow full colonizate potential (i.e. logs/snags if are not new foll and not frantsent).	Su hoptimal ale 40-70% mis of sia well suited for full colonization paton adequate habitat fo le mainterrance of polat presence of additio ion substrato in the fon at fall, but not yet pret coloration (may rat end of scale).	ble habitat; 20-40 habitatiat; avallat or destrai pulations; frequéi inal or reini m of new pared for te at figh	larginal PK mix of stable it; habitat itily less than ole; sbustrate ntly disturbed	Less t habitat obviou	Poor han 20% stable , lack of habital is; substrate de or lacking.	
SCOF 2. Embeddedness	Optimal Optimal Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment, Layering of cobble provides	15 14 (13) 12 Suboptimal Gravel, cobble, at boulder particles 50% surrounded I sediment.	Ma are 25 boulder	8 7 6 rginal cobble, and particles are 50- rounded by fine f.	Gravel, o boulder more tha	led by fine	
SCORI 3. Velocity/Depth Regime	diversity of niche space, 20 19 18 17 16 Optimal Cover All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep,	Suboptimal Only 3 of the 4 reg present (if fast sha is missing, score to than if missing oth	Mar imes Only 2 of allow regimes power shallow o	8 7 6 ginal the 4 habitat present (if fast- r slow-shallow ng, score low),		10	
SCORE	fast-shallow). Slow is <0.3 m/s, deep is >0.5 20 19 18 17 16	regimes). 15 14 13 12 (1 10 9 8	7 6	5 4 3	2 1	

4. Sediment Deposition

Optimal Little or no enlargement of Islands or point bars and less than 5% (<20% for I:ow-gradient streams) of the bottom affected by sediment deposition.

SCORE 20 19 18 17 16

mis.

Optimal Water reaches base of both lower banks, and minimal amount of channel substrate is.

exposed. SCORE 20 19 18 17 16. : 15 14 13 12 11

6, Channel Alteration

5, Channel Flow

Status

Öplimal Channelization or dredging absent or minimal; stream with normal patter.

SCORE 20 19 18 17 16

7. Frequency of Riffles (or bends)

Optimal Occurrence of riffles relatively frequent ratio of distance blw. riffled divided by width of the stream <7:1 *generally 5 to 7): variety of habitats If key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.

SCORE 20 19 18 17 16

8. Bank Stability (score each bank)

Optimal Banks stable; evidence of erosion or bank failure absent or minimal; little potential forfulure problems. < 5% of bank affected.

SCORE RB 10 9 SCORE LB 10 9 Optimal

9. Vegetative Protection (score each More than 90% of the

bankj stream bank surfaces and immediate riparian zone covered by native vegetation, including frees, understory shrubs, or non-woody macrophyles; vegetative disruption through grazing or mowing minimal of not evident;

almost all plants allowed to grow naturally.

SCORE RB 10 9 SCORE LB 10

10. Riparian Vegetative Zone Width Width of riparian zone (score each bank)

Optimal >18 m; human activities (i.e. parking lots, roadbaeds, clear-cuts, lawns, or crops) have not impacted zone.

SCORE RB 10 SCORELB 10 0

Suboplimal Some new increase in bar formation, mostly from gravel, sand or fine sediment. 5-30% (20-50% for low-gradlent) of the bottom affected; slight deposition in pools.

15 14 13 12 11

Suboptimal Water fills >75% of the available channel; or 25% of channel substrate is exposed.

Suboptimal Some channelization present, usually in areas of bridge abutements; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.

15 (14) 13 12 11

Suboptimal Occurrence of rifiles infrequent; distance bow. riffles divided by the width of the stream Is btw. 7 to 15.

9 8 7 6 15 14 13 12 (11)

Suboptimal Moderately stable; Infrequent, small areas of crosion mostly healed over 5-30% of bank in reach has areas of croslon.

8 67 G G Suboptimal 70-90% of stream bank surfaces covered by nativa vegelation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant slubble helght

7 6 7

> 7 6

7

remaining.

Suboptimal Width of riparian zone 12-18 m; human activites have impacted zone only minimally.

4 5 4 3 Marginal

5 4

1

Width of riparian zone 6-12 m; human activite id have impacted zone a great deal.

Poor Heavy deposits of fine Moderate deposition of new gravel, sand or fine sediment on old and material, increased bar development; more than new bars: 30-50% (50-50% (80% for lowgradient) of the bottom 80% for low-gradient) of changing frequently;

10 (9) 8 7

Marginal

Marginal Water fills 25-75% of the avallable channel, and/or riffle substrates are mostly exposed.

10 9 8 7

Channelization may be extensive; embankments or shoring structures present on both banks; and 40 - 80% of stream reach channelized and disrupted.

Poor Very liltle water in channel and mostly present as slanding pools.

pools almost absent,

5 4 3 2 1

5 4 3 2 1 Marginal Poor Banks shored with gablon or cement over 80% of the stream reach channelized and disrupted. Instream habitat greatly aftered or removed entirely,

10 9 8 7 5 4 3 2 1

Marginal Occasional riflle or bend; bollom confours provide saomo habital; distance btw. riffles divided by the width of the stream is blw. 15 to 25

Marginal

60% of bank in reach

has areas of erosion:

high erosion potential

during floods.

3

50-70% of the stream

disruption obvious;

vegetation common;

patches of bare soil or

less then one-half of the

potential plant stuibble

bank surfaces covered

5 4 3

Marginal

by vegetation;

closely cropped

helght remaining.

5 4

Poor Generally all flat water or shallow riffles; poor habitat; distance btw. riffles dividied by the width of the stream is a ration of >25%.

4 3 2 1 Poor

Moderately unstable, 30-Unslable; many eroded areas "raw" areas

Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has: been removed to 5 cm or less in average stubble height.

2 0 1 2 1 Poor

1

2 1

Width if dparianzone <6 m; Iltila or no riparian yegetation due to human activities.

SCORE

Station ID: [199.61-BPR] Bentinic Macroinvertebrate Field Data Sheet (front) Land: Use	
Fleld Team: JEB JDD Survey Reason: Bio, Monitoring Start Time: 12:15	4
Stream Name: Powell River Location: 50m upstream of road Finish Time: 12:40	
Date: 5/16/13 Latitude: 37.01273 Longitude: 82.69593 Stream Physicochemical	
Instrument ID number: Temperature: 13.7 Go: Dissolved Oxygen: [2. 98 mg/l] Did instrument pass all post-calibration checks? Y/N If NO - which parameter(s) failed and action	*
Benthic Wacroinvertebrate Collection	
Method used (circle one) Single Habitat (Rittle) Multi Habitat (Logs, plants, etc.)	
Riffle Quality (circle one) Good Marginal Poor None Habitats sampled (circle one) Riffle Snags Banks Vegetation Area Sampled (sq. m.): # jabs	Z
Weather Observations	
Current Wealiner (circle one) Gloudy Clear Rajn(Snow Foggy Recent precipitation (circle one) Gload Showers Rain Storms Other	
Stream flow (circle one) Low Normal Above Normal Flood	
INSTREAM WATERSHED LOCAL WATERSHED FEATUREES;	
Stream Width Range of Depth 0.5 ft O Surface Mining 0 Construction Freedominant Surrounding Land Use: O Surface Mining 0 Construction Forest	
Average Velocity fl/s Deep Mining O Commercial O Pasture/Grazing	
Discharge cfs 0 Oil Wells 0 Industrial 0 Silviculture Est, Reach Length 0 Land Disposal 0 Row Crops 0 Urban Runoff/Storm Sewers	
Hydraulic Structures: Stream Flow: Stream Type:	
θ Dams θ Bridge Abuments θ Dry θ Pooled θ Low θ Normal θ Perennial θ Intermittent	
0 Island 0 Waterfalls 9 High 0 Very Rapid or Torrential 0 Ephemeral 0 Seep 0 Other	
Riparian Vegelation: Dom. Tree/Shrub Taxa Canopy Cover: Channel Afterations:	
Dominate Type: Backeye Fully Shaded (75-100%) # Dredging Trees # Shrubs Poplar # Partially Shaded (50-75%) # Channelization	
Orasses O Herbaceous Number of strata 2 Number of strata 2 Popularially Exposed (25-50%) (ΘFull ΘPartial) OFully Exposed (0-25%)	
Substrate 0Est, OP.C. Riffle 20 % Run 20 % Pool 0 %	
HighGradient Habitat Data Sheet	
Optimal Suboptimal Marginal Poor 1. Epifaurial Greater then 70% of substrate 40-70% mfs of stable inabilate: 20-40% mfx of stable Less than 20% stable	
Substrate/Available favorable for epifauna well suited for full habitat; habitat habitat habitat habitat is	
Gover colonization and fish cover; colonization potential; availability less than obvious; substrate mix of snags, submerged adequate habitation destrable; sbustrate unstable or lacking.	
logs, undercut banks, cobble maintenance of populations; frequently disturbed or other stable habitat and at presence of additional or removed.	
stage to allow full colonization substrate in the form of new	
potential (i.e. logo/snags that fall, but not yet prepared for are not new fall and not colinzation (may rate at fight and of scale).	
SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 2. Embeddedness Optimal Subortinal Marginal Poor	
Gravel, cobble, and Gravel, cobble, and Gravel, cobble, and Gravel, cobble, and	
boulder particles are 0- boulder particles are 25- boulder particles are 50- boulder particles are 25% surrounded by fine 75% surrounded by fine more that 75%	
sediment. Layering of sediment. sediment. surrounded by fine cobble provides sediment.	
. diversity of niche space, SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1	
3. Velocity/Depth Optimal Suboptimal Marginal Poor	
velocity/depth regimes present (if fast-shallow regimes present (if fast- yeolcity/depth regime	
present (slow-deep, is missing, score lower shallow or slow-shallow (usually slow-deep). slow-shallow, fast-deep, than if missing other are missing, score low).	
fast-shallow). Slow is regimes).	

SCORELB 10 (9

Poor! 4. Sediment Suboplimal Marginal Optimal Heavy deposits of fine Some new increasé in Moderate deposition of Deposition Little or no enlargement material, increased bar development; more than new gravel, sand or fine sediment on bld and new bars; 30-50% (50of Islands or point bars bar formation, mostly from gravel, sand or and less than 5% (<20% 50% (80% for lowfine sediment. 5-30% (20for I; ov-gradient gradient) of the bottom 80% for low-gradient) of streams) of the bottom `50% for low-gradlent) of changing frequently; pools almost absent. affected by sediment the bottom affected; deposition. slight deposition in SCORE pools. 15 14 13 12 11 8 5 4 3 2 1 20 19 18 17 16 mis. Optimal Suboptimal Marginal Poor' Very liltle water in Water fills >75% of the Water fills 25-75% of the 5, Channel Flow Water reaches base of channel and mostly Status both lower banks, and available channel; or available channel, present as slanding 25% of channel and/or riffle substrates minimal amount of pools. channel substrato is. substrate is exposed. are mostly exposed. exposed. 4 3 2 1 SCORE 20 19 18 17 16 : 45 14 13 12 11 9 8 7 6 6. Channel Alteration Öptimal Suboptimal Marginal Poor Banks shored with Channelization or Some channelization Channelization may be gablon or cement over dredging absent or present, usually in areas extensive; embankments 80% of the stream reach minimal; stream with of bridge abutements; or shoring structures channelized and normal patter. evidence of past present on both banks; disrunted.Instream and 40 - 80% of stream channelization, i.e., habitat greatly aftered or dredging, (greater than reach channelized and removed entirely, past 20 yr.) may be disrupted. present, but recent channelization is not present. 15 14 13 12 11 10 9 8 7 5 4 3 2 1 SCORE 20 19 18 17 16 7. Frequency of Riffles Suboplimal Marginal Poor Optimal Generally all flat water (or bends) Occurrence of rifiles Occasional rifile or Occurrence of riffles or shallow riffles; poor Infrequent; distance bend; bollom confours relatively frequent ratio of distance blw. riffled divided by width of the btw. rifflesdivided by provide saomo habitat; habitat; distance btw. riffles dividled by the the width of the stream distance btw. riffles stream <7:1*generally 5 to 7); variety of habitals divided by the width of width of the stream is a Is btw. 7 to 15. the stream is blw. 15 to ration of >25%. If key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. 4 3 2 1 10 9 8 7 6 15 14 13 (12) 11 SCORE 20 19 18 17 16 Marginal Poor 8. Bank Stability Suboptimal Optimal Banks stable; evidence Unslable; many eroded (score each bank) Moderately stable; Moderately unstable, 30of eroston or bank infrequent, small areas 60% of bank in reach areas "raw" areas has areas of erosion; failure absent or of erosion mostly healed over, 5-30% of high erosion potential minimal; little potential bank in reach has areas during floods. for future problems. < of erosion. 5% of bank affected. 8 7 G 1 C SCORE RE 10 9 5 4 2 1 0 SCORE LB 10 3 Marginal Poor 9. Vegetative Suboptimal Optimal 50-70% of the stream Less than 50% of the Protection (score each More than 90% of the 70-90% of stream bank bank surfaces covered stream bank surfaces banki stream bank surfaces surfaces covered by and immediate riparian nativa vegelation, but by vegetation; covered by vegetation; disruption obvious; one class of plants is disruption of stream zone covered by native patches of bare soll or bank vegetation is very not well-represented; vegetation, including frees, understory shrubs, or non-woody macrophyles; vegetative disruption through disruption evident but closely cropped high; vegetation has not affecting full plant vegelation common; been removed to 5 cm growth potential to any less then one-half of the or less in average great extent; more than potential plant stuibble slubble height. grazing or mowing minimal or moving one-half of the potential height remaining. plant slubble helght almost all plants remaining. allowed to grow naturally. 2 1 0 SCORE RB 10 6 9 7 5 1 SCORE LB 10 R 10. Riparian Suboptimal Marginal Poor Optimal Vegetative Zone Width Width of riparlan zorre Width if riparianzone Width of riparian zone Width of riparlan zone <6 m; little or no 6-12 m; human activite id (score each bank) >18 m; human activities 12-18 m; human activites riparian vegetation due (i.e, parking fols, roadbaeds, clear-cuts, have impacted zone have impacted zone a to human activities. only minimally. great deal. lawns, or crops) have not impacted zone. 2 1 SCORE RB 10 (9) 7 6 5 4 3

4

7

SCORE

APPENDIX B:

TABLES



Table 1. Quantitative listings of macroinvertebrates collected 14 and 16 May 2013 from six aquatic sample sites for surface mine permit number 1101760 in Wise County, Virginia.

Order	Family			Spring	g 2013		
		BRFK-1	BRFK-2	BRFK-3	BRFK-4	BCPT-1	BPR-1
Ephemeroptera	Baetidae		1	1	28	17	6
Plecoptera	Leuctridae				1	25	49
	Nemouridae	20		4	5	14	12
	Peltoperlidae						1
	Perlidae						1
	Perlodidae					7	6
Trichoptera	Hydropsychidae	62	52	57	38	16	18
	Hydroptilidae		1				
	Philopotamidae					1	
	Polycentropodidae				1		
Coleoptera	Elmidae					1	16
	Psephenidae						2
Diptera	Ceratopogonidae	1					
	Chironomidae	16	30	34	27	30	3
	Empididae	6	10	1	7	4	6
	Simuliidae		7	2		4	
	Tipulidae	2		1			
Odonata	Gomphidae			1			
Decapoda	Cambaridae	2	1				1
Annelida	Oligochaeta	2	8	8	3		
		111	110	109	110	119	121

Table 2. VSCI metrics calculated from the macroinvertebrates collected 14 and 16 May 2013 at six aquatic sample sites for surface mine permit number 1101760 in Wise County, Virginia

Comily Metrico		Spring 2013									
Family Metrics	BRFK-1	BRFK-2	BRFK-3	BRFK-4	BCPT-1	BPR-1					
Taxa Richness	8	8	9	8	10	12					
EPT Taxa	2	3	3	5	6	7					
% Ephemeroptera	0	0.91	0.92	25.45	14.29	4.96					
% PT - Hydropsychidae	18	0.9	3.7	6.4	39.5	57					
% Scrapers	0	0.91	0	0	0.84	14.88					
% Chironomidae	14.41	27.27	31.19	24.55	25.21	2.48					
% 2 Dominant	73.87	74.55	83.49	60	46.22	55.37					
FBI	5.19	5.97	5.74	5.23	3.65						
VSCI	37.4	29.78	29.41	43.07	58.86	64.64					

Table 3. Physiochemical water data collected 14 and 16 May 2013 at six aquatic sample sites for surface mine permit number 1101760 in Wise County, Virginia.

Parameter	BRFK-1	BRFK-2	BRFK-3	BRFK-4	BCPT-1	BPR-1
Temperature (Celsius)	14.7	15.5	15.2	14.7	16.1	13.7
Specific Conductance (µs)	*59.7	1319	*55.2	*54.9	855	823
рН	8.01	8.27	8.32	8.29	8.05	8.09
Dissolved Oxygen mg/l)	12.88	12.72	12.63	12.95	12.16	12.98

^{* =} Meter Malfunction

APPENDIX C:

GRAB SAMPLE ANALYSIS





ENVIRONMENTAL CONSULTANTS A ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 1 of 3

Client Name: RED RIVER COAL COMPANY

Address:

Sample Identification: 1199.01 - BCPT1

Site Description: 1101760

P.O. BOX 668

NORTON, VA

24273

Report Date: 05/30/13

Lab Sample No.: 1325819

Client No.:

95

EMI Project No.: 97

Date Collected:

05/16/13

Time Collected:

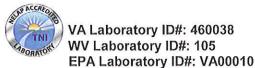
825

Sample Matrix: AQ

Collected By: J BREEDING

Parameter		Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Acidity Hot		BDL	mg/l CaCO3	1.00	1.00	SM 2310B-2011	5/28/2013	1334	MCF
Acidity, Hot			mg/I CaCO3		1.00	SM 2320B-2011	5/28/2013	927	MCF
Alkalinity		175		1.00	1.00				
Alkalinity, CO3	Not NELAP	1.63	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Alkalinity, HC03	Not NELAP	173	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Bromide		0.070 J	mg/l	0.020	0.200	EPA 300.0	5/17/2013	1444	JLW
Chloride		4.74	mg/l	0.011	0.100	EPA 300.0	5/24/2013	1413	KMC
Conductivity		903	umhos/cm	1.00	1.00	SM 2510B-2011	5/17/2013	1955	JRS
Flow, Measured	Not NELAP	2173	gpm				5/16/2013	825	FLD
Hardness, Total		420	mg/l CaCO3	4.00	4.00	SM 2340 C-2011	5/17/2013	1634	SAS
Nitrate		2.44	mg/l	0.012	0.200	EPA 300.0	5/17/2013	1444	JLW
Nitrite		0.090 J	mg/l	0.016	0.200	EPA 300.0	5/17/2013	1444	JLW
рН	Not NELAP	8.05	STD			SM 4500-H+B-201	5/16/2013	825	FLD
Sulfate		288	mg/l	0.206	1.00	EPA 300.0	5/24/2013	1413	KMC
Total Dissolved Solids		678	mg/l	50.0	50.0	SM 2540C-2011	5/17/2013	1336	THR
Total Suspended Solids		3.00	mg/l	2.50	2.50	SM 2540 D-2011	5/16/2013	2307	MLS

To the best of our knowledge and belief, the collection, preservation, and analysis of all parameters represented by this report have been determined to comply the requirements as specified in 40 CFR, Part 136. This report may not be reproduced except in full, without the written approval of the laboratory.



VA Laboratory ID#: 460038 WV Laboratory ID#: 105

The release of this report is authorized by:

R. J. Porter **Technical Director**

Flow if Avaliable (GPM): 2173.0

Type of Sample: Grab

Temp. if Available (C): 12.2 BDL = Below Detection Limit

Depth if Available (Ft):

FLD = Field Technician

Analysis Package Code:

EPA0902R

MR = Multiple analytical runs were used for this result IV = Flag indicates Insufficient Sample Volume

J = Flag indicates estimated value below Report Limit

T = Results indicate possible toxicity which is expected to influence reported value.

NA = A result for this analyte is not available

MI = Matrix Interference - Final result may not be representative.

BQ = Batch QC Outside Acceptable Range HE = Parameter Hold Time Exceeded

FC = Failure to Comply Current SOP

R = Sample results rejected because of gross deficiencies in QC or method performance .

PSCN

Rev-7-24-12



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 2 of 3

Client Name: RED RIVER COAL COMPANY

Address: P.O. BOX 668

Sample Identification: 1199.01 - BCPT1

Site Description: 1101760

NORTON, VA

24273

Report Date: 05/30/13

Lab Sample No.: 1325819

Client No.: 95

EMI Project No.: 97

Date Collected: 05/16/13

Time Collected: 825

Sample Matrix: AQ

Collected By: J BREEDING

					Conceica B.	y. J DKEEL	MO	
Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Aluminum, Total	0.094	mg/l	0.024	0.050	200.7	5/21/2013	6	AWM
Antimony, Total	BDL	ug/l	0.113	2.00	200.8	5/21/2013	1307	CLS
Arsenic, Total	0.350 J	ug/l	0.154	2.00	200.8	5/21/2013	1307	CLS
Barium, Total	78.3	ug/l	0.171	2.00	200.8	5/21/2013	1307	CLS
Beryllium, Total	BDL	ug/l	0.078	2.00	200.8	5/21/2013	1307	CLS
Boron, Total	0.012 J	mg/l	0.0054	0.030	200.7	5/22/2013	1315	AWM
Cadmium, Total	BDL	ug/l	0.154	2.00	200.8	5/21/2013	1307	CLS
Chromium, Total	0.137 J	ug/l	0.098	2.00	200.8	5/21/2013	1307	CLS
Cobalt, Total	0.363 J	ug/l	0.143	2.00	200.8	5/21/2013	1307	CLS
Copper, Total	0.555 J	ug/l	0.080	2.00	200.8	5/21/2013	1307	CLS
Iron, Total	0.415	mg/l	0.016	0.050	200.7	5/21/2013	6	AWM
Lead, Total	0.140 J	ug/l	0.054	2.00	200.8	5/21/2013	1307	CLS
Magnesium, Total	44.9	mg/l	0.032	0.500	EPA 200.7	5/22/2013	936	AWM
Manganese, Total	0.109	mg/l	0.011	0.050	200.7	5/21/2013	6	AWM
Mercury, Total	BDL	ug/l	0.161	0.500	EPA 245.1-REV.3	5/21/2013	1409	SAS
Nickel, Total	0.983 J	ug/l	0.169	2.00	200.8	5/21/2013	1307	CLS
Selenium, Total	5.00	ug/l	0.731	2.00	200.8	5/21/2013	1307	CLS



ENVIRONMENTAL CONSULTANTS A ANALYTICAL LABORATORIES P.O. BOX 1190 A NORTON, VIRGINIA 24273 A 276/679-6544

Certificate of Analysis

Page: 3 of 3

Client Name: RED RIVER COAL COMPANY

Sample Identification: 1199.01 - BCPT1

Site Description: 1101760

Address: P.O. BOX 668

NORTON, VA

24273

Report Date: 05/30/13

1325819 Lab Sample No.:

Client No.:

EMI Project No.:

97

Date Collected:

05/16/13

Time Collected:

825

Sample Matrix: AQ

Collected By: J BREEDING

Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Silver, Total	BDL	ug/l	0.101	2.00	200.8	5/21/2013	1307	CLS
Thallium, Total	BDL	ug/l	0.076	2.00	200.8	5/21/2013	1307	CLS
Zinc, Total	1.23 J	ug/l	0.328	10.0	200.8	5/21/2013	1307	CLS



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 1 of 3

Client Name: RED RIVER COAL COMPANY

Sample Identification: 1199.01 - BRFK4

Site Description: 1101760

Address: P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325820

Client No.:

EMI Project No.: 97

Date Collected: 05/16/13

915

Time Collected:

Sample Matrix: AQ

Collected By: J BREEDING

Parameter		Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
		#-0_L_11/4 (N-01)		- John Wellson					
Acidity, Hot		BDL	mg/l CaCO3	1.00	1.00	SM 2310B-2011	5/28/2013	1335	MCF
Alkalinity		172	mg/l CaCO3	1.00	1.00	SM 2320B-2011	5/28/2013	930	MCF
Alkalinity, CO3	Not NELAP	3.17	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Alkalinity, HC03	Not NELAP	169	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Bromide		BDL	mg/l	0.020	0.200	EPA 300.0	5/17/2013	1500	JLW
Chloride		5.19	mg/l	0.011	0.100	EPA 300.0	5/24/2013	1423	KMC
Conductivity		1309	umhos/cm	1.00	1.00	SM 2510B-2011	5/17/2013	1956	JRS
Flow, Measured	Not NELAP	8560	gpm				5/16/2013	915	FLD
Hardness, Total		560	mg/l CaCO3	4.00	4.00	SM 2340 C-2011	5/17/2013	1634	SAS
Nitrate		0.740	mg/l	0.012	0.200	EPA 300.0	5/17/2013	1500	JLW
Nitrite		0.090 J	mg/l	0.016	0.200	EPA 300.0	5/17/2013	1500	JLW
рН	Not NELAP	8.29	STD			SM 4500-H+B-201	5/16/2013	915	FLD
Sulfate		458	mg/l	1.03	5.00	EPA 300.0	5/29/2013	1819	KMC
Total Dissolved Solids		1032	mg/l	50.0	50.0	SM 2540C-2011	5/17/2013	1338	THR
Total Suspended Solids		8.00	mg/l	2.50	2.50	SM 2540 D-2011	5/16/2013	2306	MLS

To the best of our knowledge and belief, the collection, preservation, and analysis of all parameters represented by this report have been determined to comply the requirements as specified in 40 CFR, Part 136. This report may not be reproduced except in full, without the written approval of the laboratory.



VA Laboratory ID#: 460038 WV Laboratory ID#: 105

EPA Laboratory ID#: VA00010

The release of this report is authorized by:

R. J. Porter **Technical Director**

Flow if Avaliable (GPM):

8560.0

Type of Sample: Grab

BDL = Below Detection Limit

FLD = Field Technician

MR = Multiple analytical runs were used for this result

IV = Flag indicates Insufficient Sample Volume

J = Flag indicates estimated value below Report Limit

T = Results indicate possible toxicity which is expected to influence reported value.

NA = A result for this analyte is not available.

MI = Matrix Interference - Final result may not be representative.

BQ = Batch QC Outside Acceptable Range HE = Parameter Hold Time Exceeded

FC = Failure to Comply Current SOP R = Sample results rejected because of gross deficiencies in QC or method performance

Temp. if Available (C):

14.7

Depth if Available (Ft):

Analysis Package Code: EPA0902R

Rev-7-24-12



ENVIRONMENTAL CONSULTANTS A ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 2 of 3

Client Name: RED RIVER COAL COMPANY

Address: P.O. BOX 668

Sample Identification: 1199.01 - BRFK4

Site Description: 1101760

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325820

Client No.: 95

EMI Project No.: 97

Date Collected: 05/16/13

Time Collected: 915 Sample Matrix: AQ

Collected By: J BREEDING

					, v Bridgenio				
Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst	
	0.115	4	0.004	0.050	200.7	5/21/2012	0	433734	
Aluminum, Total	0.117	mg/l	0.024	0.050	200.7	5/21/2013	8	AWM	
Antimony, Total	0.235 J	ug/l	0.113	2.00	200.8	5/21/2013	1227	CLS	
Arsenic, Total	0.261 J	ug/l	0.154	2.00	200.8	5/21/2013	1227	CLS	
Barium, Total	35.0	ug/l	0.171	2.00	200.8	5/21/2013	1227	CLS	
Beryllium, Total	BDL	ug/l	0.078	2.00	200.8	5/21/2013	1227	CLS	
Boron, Total	0.015 J	mg/l	0.0054	0.030	200.7	5/22/2013	1319	AWM	
Cadmium, Total	BDL	ug/l	0.154	2.00	200.8	5/21/2013	1227	CLS	
Chromium, Total	0.153 J	ug/l	0.098	2.00	200.8	5/21/2013	1227	CLS	
Cobalt, Total	0.381 J	ug/l	0.143	2.00	200.8	5/21/2013	1227	CLS	
Copper, Total	0.581 J	ug/l	0.080	2.00	200.8	5/21/2013	1227	CLS	
Iron, Total	0.351	mg/l	0.016	0.050	200.7	5/21/2013	8	AWM	
Lead, Total	0.178 J	ug/l	0.054	2.00	200.8	5/21/2013	1227	CLS	
Magnesium, Total	58.4	mg/l	0.032	0.500	EPA 200.7	5/22/2013	941	AWM	
Manganese, Total	0.075	mg/l	0.011	0.050	200.7	5/21/2013	8	AWM	
Mercury, Total	BDL	ug/l	0.161	0.500	EPA 245.1-REV.3	5/21/2013	1409	SAS	
Nickel, Total	1.16 J	ug/l	0.169	2.00	200.8	5/21/2013	1227	CLS	
Selenium, Total	3.56	ug/l	0.731	2.00	200.8	5/21/2013	1227	CLS	



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 3 of 3

Client Name: RED RIVER COAL COMPANY

Sample Identification: 1199.01 - BRFK4

Site Description: 1101760

Address: P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325820

Client No.:

95 EMI Project No.: 97

Date Collected: 05/16/13

Time Collected: 915

Sample Matrix: AQ

Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Silver, Total	BDL	ug/l	0.101	2.00	200.8	5/21/2013	1227	CLS
Thallium, Total	BDL	ug/l	0.076	2.00	200.8	5/21/2013	1227	CLS
Zinc, Total	1.88 J	ug/l	0.328	10.0	200.8	5/21/2013	1227	CLS



ENVIRONMENTAL CONSULTANTS A ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 1 of 3

Client Name: RED RIVER COAL COMPANY

Address:

Sample Identification: 1199.01 - BRFK3

Site Description: 1101760

P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325821

Client No.:

EMI Project No.: 97

Date Collected:

05/16/13 1000

Time Collected:

Sample Matrix: AO

Collected By: J BREEDING

						\$240mg/db_100.00x245.000000000000000000000000000000000000	**** Add ###############################		
Parameter		Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Acidity, Hot		BDL	mg/l CaCO3	1.00	1.00	SM 2310B-2011	5/28/2013	1335	MCF
Alkalinity		202	mg/l CaCO3	1.00	1.00	SM 2320B-2011	5/28/2013	932	MCF
Alkalinity, CO3	Not NELAP	3.71	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Alkalinity, HC03	Not NELAP	198	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Bromide		0.070 J	mg/l	0.020	0.200	EPA 300.0	5/17/2013	1516	JLW
Chloride		6.61	mg/l	0.011	0.100	EPA 300.0	5/24/2013	1433	KMC
Conductivity		1384	umhos/cm	1.00	1.00	SM 2510B-2011	5/17/2013	1956	JRS
Flow, Measured	Not NELAP	4574	gpm				5/16/2013	1000	FLD
Hardness, Total		540	mg/l CaCO3	4.00	4.00	SM 2340 C-2011	5/17/2013	1634	SAS
Nitrate		0.500	mg/l	0.012	0.200	EPA 300.0	5/17/2013	1516	JLW
Nitrite		0.090 J	mg/l	0.016	0.200	EPA 300.0	5/17/2013	1516	JLW
pН	Not NELAP	8.32	STD			SM 4500-H+B-201	5/16/2013	1000	FLD
Sulfate		503	mg/l	1.03	5.00	EPA 300.0	5/29/2013	1620	KMC
Total Dissolved Solids		1044	mg/l	50.0	50.0	SM 2540C-2011	5/17/2013	1339	THR
Total Suspended Solids		5.00	mg/l	2.50	2.50	SM 2540 D-2011	5/16/2013	2308	MLS

To the best of our knowledge and belief, the collection, preservation, and analysis of all parameters represented by this report have been determined to comply the requirements as specified in 40 CFR, Part 136. This report may not be reproduced except in full, without the written approval of the laboratory.



VA Laboratory ID#: 460038

The release of this report is authorized by:

R. J. Porter **Technical Director**

WV Laboratory ID#: 105 **EPA Laboratory ID#: VA00010**

Type of Sample: Grab

Flow if Avaliable (GPM): 4574.0 Temp. if Available (C): 15.2

BDL = Below Detection Limit FLD = Field Technician

Depth if Available (Ft):

MR = Multiple analytical runs were used for this result

IV = Flag indicates Insufficient Sample Volume

J = Flag indicates estimated value below Report Limit

T = Results indicate possible toxicity which is expected to influence reported value.

NA = A result for this analyte is not available.

MI = Matrix Interference - Final result may not be representative.

BQ = Batch QC Outside Acceptable Range HF = Parameter Hold Time Exceeded

FC = Failure to Comply Current SOP

R = Sample results rejected because of gross deficiencies in QC or method performance.

Analysis Package Code: EPA0902R

PSCN

Rev-7-24-12



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 2 of 3

CLS

1232

Client Name: RED RIVER COAL COMPANY

2.68

ug/l

Sample Identification: 1199.01 - BRFK3

Site Description: 1101760

Selenium, Total

Address: P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325821

Client No.: 95

EMI Project No.: 97

Date Collected: 05/16/13

200.8

5/21/2013

Time Collected: 1000

Sample Matrix: AO

Collected By: J BREEDING

					Concocca D). J DREEL	21110	
Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
	0.110	,	0.004	0.050	200.7	5/21/2012	0	4 3375 4
Aluminum, Total	0.113	mg/l	0.024	0.050	200.7	5/21/2013	9	AWM
Antimony, Total	0.122 J	ug/l	0.113	2.00	200.8	5/21/2013	1232	CLS
Arsenic, Total	0.272 J	ug/l	0.154	2.00	200.8	5/21/2013	1232	CLS
Barium, Total	32.9	ug/l	0.171	2.00	200.8	5/21/2013	1232	CLS
Beryllium, Total	BDL	ug/I	0.078	2.00	200.8	5/21/2013	1232	CLS
Boron, Total	0.016 J	mg/l	0.0054	0.030	200.7	5/22/2013	1322	AWM
Cadmium, Total	BDL	ug/I	0.154	2.00	200.8	5/21/2013	1232	CLS
Chromium, Total	0.138 J	ug/l	0.098	2.00	200.8	5/21/2013	1232	CLS
Cobalt, Total	0.302 J	ug/l	0.143	2.00	200.8	5/21/2013	1232	CLS
Copper, Total	0.543 J	ug/l	0.080	2.00	200.8	5/21/2013	1232	CLS
Iron, Total	0.293	mg/l	0.016	0.050	200.7	5/21/2013	9	AWM
Lead, Total	0.173 J	ug/l	0.054	2.00	200.8	5/21/2013	1232	CLS
Magnesium, Total	55.9	mg/l	0.032	0.500	EPA 200.7	5/22/2013	946	AWM
Manganese, Total	0.069	mg/l	0.011	0.050	200.7	5/21/2013	9	AWM
Mercury, Total	BDL	ug/l	0.161	0.500	EPA 245.1-REV.3	5/21/2013	1409	SAS
Nickel, Total	1.05 J	ug/l	0.169	2.00	200.8	5/21/2013	1232	CLS

0.731

2.00



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 A NORTON, VIRGINIA 24273 A 276/679-6544

Certificate of Analysis

Page: 3 of 3

Client Name: RED RIVER COAL COMPANY

Address:

Sample Identification: 1199.01 - BRFK3

Site Description: 1101760

P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325821

Client No.: 95

EMI Project No.: 97

Date Collected: 05/16/13

Time Collected: 1000

Sample Matrix: AQ

Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Silver, Total	BDL	ug/l	0.101	2.00	200.8 200.8	5/21/2013	1232 1232	CLS CLS
Thallium, Total Zinc, Total	BDL 1.54 J	ug/l ug/l	0.076 0.328	2.00 10.0	200.8	5/21/2013 5/21/2013	1232	CLS



ENVIRONMENTAL CONSULTANTS A ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 1 of 3

Client Name: RED RIVER COAL COMPANY

Address: P.O. BOX 668

Sample Identification: 1199.01 - BRFK2

Site Description: 1101760

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325822

Client No.: 95

EMI Project No.: 97

Date Collected: 05/16/13

Time Collected: 1030 Sample Matrix: AO

Collected By: J BREEDING

Parameter		Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Parameter	100 - 2 10 70 Water	Result	Units	MDL	KL	Method	Analyzed	Ananyzeu	Zinaryst
Acidity, Hot		BDL	mg/l CaCO3	1.00	1.00	SM 2310B-2011	5/28/2013	1335	MCF
Alkalinity		212	mg/l CaCO3	1.00	1.00	SM 2320B-2011	5/28/2013	935	MCF
Alkalinity, CO3	Not NELAP	3.90	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Alkalinity, HC03	Not NELAP	208	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Bromide		0.100 J	mg/l	0.020	0.200	EPA 300.0	5/17/2013	1532	JLW
Chloride		5.19	mg/l	0.011	0.100	EPA 300.0	5/24/2013	1443	KMC
Conductivity		1390	umhos/cm	1.00	1.00	SM 2510B-2011	5/17/2013	1957	JRS
Flow, Measured	Not NELAP	3699	gpm				5/16/2013	1030	FLD
Hardness, Total		524	mg/l CaCO3	4.00	4.00	SM 2340 C-2011	5/17/2013	1634	SAS
Nitrate		0.470	mg/l	0.012	0.200	EPA 300.0	5/17/2013	1532	JLW
Nitrite		0.090 J	mg/l	0.016	0.200	EPA 300.0	5/17/2013	1532	JLW
рН	Not NELAP	8.27	STD			SM 4500-H+B-201	5/16/2013	1030	FLD
Sulfate		443	mg/l	1.03	5.00	EPA 300.0	5/29/2013	1630	KMC
Total Dissolved Solids		1016	mg/l	50.0	50.0	SM 2540C-2011	5/17/2013	1340	THR
Total Suspended Solids		8.00	mg/l	2.50	2.50	SM 2540 D-2011	5/16/2013	2309	MLS

To the best of our knowledge and belief, the collection, preservation, and analysis of all parameters represented by this report have been determined to comply the requirements as specified in 40 CFR, Part 136. This report may not be reproduced except in full, without the written approval of the laboratory.



VA Laboratory ID#: 460038

WV Laboratory ID#: 105 **EPA Laboratory ID#: VA00010**

The release of this report is authorized by:

R. J. Porter **Technical Director**

Flow if Avaliable (GPM):

Type of Sample: Grab

BDL = Below Detection Limit

FLD = Field Technician

MR = Multiple analytical runs were used for this result

IV = Flag indicates Insufficient Sample Volume

J = Flag indicates estimated value below Report Limit

T = Results indicate possible toxicity which is expected to influence reported value.

NA = A result for this analyte is not available

MI = Matrix Interference - Final result may not be representative.

BQ = Batch QC Outside Acceptable Range HE = Parameter Hold Time Exceeded

FC = Failure to Comply Current SOP R = Sample results rejected because of gross deficiencies in QC or method performance

Temp. if Available (C): 15.5

Depth if Available (Ft):

3699.0

Analysis Package Code:

EPA0902R

PSCN Rev-7-24-12



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 2 of 3

1237

5/21/2013

CLS

Sample Identification: 1199.01 - BRFK2

Site Description: 1101760

Selenium, Total

Client Name: RED RIVER COAL COMPANY

2.30

Address: P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325822

Client No.: 95

EMI Project No.: 97

Date Collected: 05/16/13

Time Collected: 1030

Sample Matrix: AQ

Collected By: J BREEDING

					Concecta By. J BREEDING			
Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Aluminum, Total	0.115	mg/l	0.024	0.050	200.7	5/21/2013	11	ΛWM
Antimony, Total	0.114 J	ug/l	0.113	2.00	200.8	5/21/2013	1237	CLS
Arsenic, Total	0.256 J	ug/l	0.154	2.00	200.8	5/21/2013	1237	CLS
Barium, Total	31.6	ug/l	0.171	2.00	200.8	5/21/2013	1237	CLS
Beryllium, Total	BDL	ug/l	0.078	2.00	200.8	5/21/2013	1237	CLS
Boron, Total	0.016 J	mg/l	0.0054	0.030	200.7	5/22/2013	1326	AWM
Cadmium, Total	BDL	ug/l	0.154	2.00	200.8	5/21/2013	1237	CLS
Chromium, Total	0.142 J	ug/l	0.098	2.00	200.8	5/21/2013	1237	CLS
Cobalt, Total	0.343 J	ug/l	0.143	2.00	200.8	5/21/2013	1237	CLS
Copper, Total	0.527 J	ug/l	0.080	2.00	200.8	5/21/2013	1237	CLS
Iron, Total	0.310	mg/l	0.016	0.050	200.7	5/21/2013	11	AWM
Lead, Total	0.180 J	ug/l	0.054	2.00	200.8	5/21/2013	1237	CLS
Magnesium, Total	56.6	mg/l	0.032	0.500	EPA 200.7	5/22/2013	950	AWM
Manganese, Total	0.085	mg/l	0.011	0.050	200.7	5/21/2013	11	AWM
Mercury, Total	BDL	ug/l	0.161	0.500	EPA 245.1-REV.3	5/21/2013	1409	SAS
Nickel, Total	1.10 Ј	ug/l	0.169	2.00	200.8	5/21/2013	1237	CLS

0.731

ug/l

2.00

200.8



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 3 of 3

Client Name: RED RIVER COAL COMPANY

Sample Identification: 1199.01 - BRFK2

Site Description: 1101760

Address: P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.:

1325822

Client No.:

97

EMI Project No.:

Date Collected: 05/16/13

Time Collected:

1030

Sample Matrix: AQ

Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Silver, Total	BDL	ug/l	0.101	2.00	200.8	5/21/2013	1237	CLS
Thallium, Total	BDL	ug/l	0.076	2.00	200.8	5/21/2013	1237	CLS
Zinc, Total	3.00 J	ug/l	0.328	10.0	200.8	5/21/2013	1237	CLS



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 1 of 3

Client Name: RED RIVER COAL COMPANY

Address: P.O. BOX 668

Sample Identification: 1199.01 - BRFK1

Site Description: 1101760

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325823

Client No.: 95

EMI Project No.: 97

Date Collected:

ted: 05/16/13

Time Collected: 1110

Sample Matrix: AQ

Collected By: J BREEDING

Parameter		Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Tarameter			Philippine Mary and						
Acidity, Hot		BDL	mg/l CaCO3	1.00	1.00	SM 2310B-2011	5/28/2013	1336	MCF
Alkalinity		232	mg/l CaCO3	1.00	1.00	SM 2320B-2011	5/28/2013	939	MCF
Alkalinity, CO3	Not NELAP	2.16	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Alkalinity, HC03	Not NELAP	230	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Bromide		0.070 J	mg/l	0.020	0.200	EPA 300.0	5/17/2013	1548	JLW
Chloride		4.48	mg/l	0.011	0.100	EPA 300.0	5/24/2013	1453	KMC
Conductivity		1341	umhos/cm	1.00	1.00	SM 2510B-2011	5/17/2013	1958	JRS
Flow, Measured	Not NELAP	3653	gpm				5/16/2013	1110	FLD
Hardness, Total	110111-	496	mg/l CaCO3	4.00	4.00	SM 2340 C-2011	5/21/2013	1335	SET
Nitrate		0.420	mg/l	0.012	0.200	EPA 300.0	5/17/2013	1548	JLW
Nitrite		0.090 J	mg/l	0.016	0.200	EPA 300.0	5/17/2013	1548	JLW
pH	Not NELAP	8.01	STD			SM 4500-H+B-201	5/16/2013	1110	FLD
Sulfate	HOLHELM	368	mg/l	1.03	5.00	EPA 300.0	5/29/2013	1640	KMC
Total Dissolved Solids		968	mg/l	50.0	50.0	SM 2540C-2011	5/17/2013	1342	THR
Total Suspended Solids		6.00	mg/l	2.50	2.50	SM 2540 D-2011	5/16/2013	2310	MLS

To the best of our knowledge and belief, the collection, preservation, and analysis of all parameters represented by this report have been determined to comply the requirements as specified in 40 CFR, Part 136.

This report may not be reproduced except in full, without the written approval of the laboratory.

The release of this report is authorized by:



VA Laboratory ID#: 460038 WV Laboratory ID#: 105

EPA Laboratory ID#: VA00010

R. J. Porter Technical Director

Flow if Avaliable (GPM): 3653.0

Type of Sample: Grab

14.7

EPA0902R

BDL = Below Detection Limit

Temp. if Available (C): Depth if Available (Ft): Analysis Package Code:

FLD = Field Technician

MR = Multiple analytical runs were used for this result
IV = Flag indicates Insufficient Sample Volume

J = Flag indicates estimated value below Report Limit

T = Results indicate possible toxicity which is expected to influence reported value.

NA = A result for this analyte is not available.

MI = Matrix Interference - Final result may not be representative.

BQ = Batch QC Outside Acceptable Range

HE = Parameter Hold Time Exceeded FC = Failure to Comply Current SOP

R = Sample results rejected because of gross deficiencies in QC or method performance

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Rev-7-24-12



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 2 of 3

Selenium, Total

Client Name: RED RIVER COAL COMPANY

1.68 J

ug/l

Address:

Sample Identification: 1199.01 - BRFK1

Site Description: 1101760

P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325823

Client No.: 95 97

EMI Project No.:

Date Collected:

200.8

5/21/2013

1302

CLS

05/16/13

Time Collected:

1110

Sample Matrix: AQ Collected By: I BREEDING

					Collected By	: JBREEL	DING	
Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Aluminum, Total	0.060	mg/l	0.024	0.050	200.7	5/21/2013	12	AWM
Antimony, Total	BDL	ug/l	0.113	2.00	200.8	5/21/2013	1302	CLS
Arsenic, Total	0.233 J	ug/l	0.154	2.00	200.8	5/21/2013	1302	CLS
Barium, Total	31.1	ug/l	0.171	2.00	200.8	5/21/2013	1302	CLS
Beryllium, Total	BDL	ug/l	0.078	2.00	200.8	5/21/2013	1302	CLS
Boron, Total	0.016 J	mg/l	0.0054	0.030	200.7	5/22/2013	1329	AWM
Cadmium, Total	BDL	ug/l	0.154	2.00	200.8	5/21/2013	1302	CLS
Chromium, Total	0.221 J	ug/l	0.098	2.00	200.8	5/21/2013	1302	CLS
Cobalt, Total	0.281 J	ug/l	0.143	2.00	200.8	5/21/2013	1302	CLS
Copper, Total	0.428 J	ug/l	0.080	2.00	200.8	5/21/2013	1302	CLS
Iron, Total	0.285	mg/l	0.016	0.050	200.7	5/21/2013	12	AWM
Lead, Total	0.090 J	ug/l	0.054	2.00	200.8	5/21/2013	1302	CLS
Magnesium, Total	49.8	mg/l	0.032	0.500	EPA 200.7	5/22/2013	955	AWM
Manganese, Total	0.102	mg/l	0.011	0.050	200.7	5/21/2013	12	AWM
Mercury, Total	BDL	ug/l	0.161	0.500	EPA 245.1-REV.3	5/21/2013	1409	SAS
Nickel, Total	0.845 J	ug/l	0.169	2.00	200.8	5/21/2013	1302	CLS

0.731

2.00



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 3 of 3

Client Name: RED RIVER COAL COMPANY

Address: P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325823

95

Client No.: 97

EMI Project No.:

Date Collected:

05/16/13

Time Collected:

1110

Sample Matrix: AQ

Site Description: 1101760

Sample Identification: 1199.01 - BRFK1

Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Silver, Total	BDL	ug/l	0.101	2.00	200.8	5/21/2013	1302	CLS
Thallium, Total	BDL	ug/l	0.076	2.00	200.8	5/21/2013	1302	CLS
Zinc, Total	1.12 J	ug/l	0.328	10.0	200.8	5/21/2013	1302	CLS



ENVIRONMENTAL CONSULTANTS A ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

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Client Name:

RED RIVER COAL COMPANY

Address:

Sample Identification: 1199.01 - BPR1

Site Description: 1101760

P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325824

Client No.:

EMI Project No.: 97

Date Collected:

05/16/13

1215

Time Collected:

Sample Matrix: AQ

Collected By: J BREEDING

Parameter		Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Acidity, Hot		BDL	mg/l CaCO3	1.00	1.00	SM 2310B-2011	5/28/2013	1336	MCF
Alkalinity		117	mg/l CaCO3	1.00	1.00	SM 2320B-2011	5/28/2013	1052	MCF
Alkalinity, CO3	Not NELAP	1.37	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Alkalinity, HC03	Not NELAP	116	mg/l	0.100		4500-CO2-D	5/29/2013	1142	JLW
Bromide		BDL	mg/l	0.020	0.200	EPA 300.0	5/17/2013	1604	JLW
Chloride		4.38	mg/l	0.011	0.100	EPA 300.0	5/24/2013	1503	KMC
Conductivity		1036	umhos/cm	1.00	1.00	SM 2510B-2011	5/17/2013	1958	JRS
Flow, Measured	Not NELAP	306	gpm				5/16/2013	1215	FLD
Hardness, Total		528	mg/l CaCO3	4.00	4.00	SM 2340 C-2011	5/21/2013	1335	SET
Nitrate		0.530	mg/l	0.012	0.200	EPA 300.0	5/17/2013	1604	JLW
Nitrite		0.090 J	mg/l	0.016	0.200	EPA 300.0	5/17/2013	1604	JLW
рН	Not NELAP	8.09	STD			SM 4500-H+B-201	5/16/2013	1215	FLD
Sulfate		396	mg/l	1.03	5.00	EPA 300.0	5/29/2013	1650	KMC
Total Dissolved Solids		822	mg/l	50.0	50.0	SM 2540C-2011	5/17/2013	1440	THR
Total Suspended Solids		5.00	mg/l	2.50	2.50	SM 2540 D-2011	5/16/2013	2313	MLS

To the best of our knowledge and belief, the collection, preservation, and analysis of all parameters represented by this report have been determined to comply the requirements as specified in 40 CFR, Part 136. This report may not be reproduced except in full, without the written approval of the laboratory.



VA Laboratory ID#: 460038

WV Laboratory ID#: 105

EPA Laboratory ID#: VA00010

The release of this report is authorized by:

R. J. Porter **Technical Director**

Flow if Avaliable (GPM):

13.7

Type of Sample: Grab

BDL = Below Detection Limit

Depth if Available (Ft):

Analysis Package Code: EPA0902R

MR = Multiple analytical runs were used for this result

IV = Flag indicates Insufficient Sample Volume

J = Flag indicates estimated value below Report Limit

T = Results indicate possible toxicity which is expected to influence reported value.

NA = A result for this analyte is not available.

MI = Matrix Interference - Final result may not be representative.

BQ = Batch QC Outside Acceptable Range HE = Parameter Hold Time Exceeded

FC = Failure to Comply Current SOP

R = Sample results rejected because of gross deficiencies in QC or method performance

Temp. if Available (C):

FLD = Field Technician

Rev-7-24-12



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 2 of 3

Client Name: RED RIVER COAL COMPANY

Address: P.O. BOX 668

Sample Identification: 1199.01 - BPR1

Site Description: 1101760

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325824

Client No.: 95

EMI Project No.: 97

Date Collected:

05/16/13

Time Collected:

1215

Sample Matrix: AQ

							CONTRACTOR OF STREET	
Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Aluminum, Total	0.083	mg/l	0.024	0.050	200.7	5/21/2013	14	AWM
Antimony, Total	BDL	ug/l	0.113	2.00	200.8	5/21/2013	1247	CLS
Arsenic, Total	0.214 J	ug/l	0.154	2.00	200.8	5/21/2013	1247	CLS
Barium, Total	71.2	ug/l	0.171	2.00	200.8	5/21/2013	1247	CLS
Beryllium, Total	BDL	ug/l	0.078	2.00	200.8	5/21/2013	1247	CLS
Boron, Total	0.0096 J	mg/l	0.0054	0.030	200.7	5/22/2013	1333	AWM
Cadmium, Total	BDL	ug/l	0.154	2.00	200.8	5/21/2013	1247	CLS
Chromium, Total	0.142 J	ug/l	0.098	2.00	200.8	5/21/2013	1247	CLS
Cobalt, Total	0.225 J	ug/l	0.143	2.00	200.8	5/21/2013	1247	CLS
Copper, Total	0.415 J	ug/l	0.080	2.00	200.8	5/21/2013	1247	CLS
Iron, Total	0.178	mg/l	0.016	0.050	200.7	5/21/2013	14	AWM
Lead, Total	0.130 J	ug/l	0.054	2.00	200.8	5/21/2013	1247	CLS
Magnesium, Total	56.4	mg/l	0.032	0.500	EPA 200.7	5/22/2013	1001	AWM
Manganese, Total	0.017 J	mg/l	0.011	0.050	200.7	5/21/2013	14	AWM
Mercury, Total	BDL	ug/l	0.161	0.500	EPA 245.1-REV.3	5/21/2013	1409	SAS
Nickel, Total	0.560 J	ug/l	0.169	2.00	200.8	5/21/2013	1247	CLS
Selenium, Total	1.74 J	ug/l	0.731	2.00	200.8	5/21/2013	1247	CLS



ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES P.O. BOX 1190 ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Page: 3 of 3

Client Name: RED RIVER COAL COMPANY

Sample Identification: 1199.01 - BPR1

Site Description: 1101760

Address: P.O. BOX 668

NORTON, VA

24273

Report Date: 06/03/13

Lab Sample No.: 1325824

Client No.:

EMI Project No.: 97

Date Collected:

05/16/13

Time Collected:

1215

Sample Matrix: AQ

Parally seems and a self-time and a second second								
Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Silver, Total	BDL	ug/l	0.101	2.00	200.8	5/21/2013	1247	CLS
Thallium, Total	BDL	ug/l	0.076	2.00	200.8	5/21/2013	1247	CLS
Zinc, Total	1.42 J	ug/l	0.328	10.0	200.8	5/21/2013	1247	CLS



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-90531-5

Client Project/Site: 95.97

For:

Environmental Monitoring, Inc. 5730 Industrial Park Rd. Norton, Virginia 24273

Attn: Donna Phillips

Authorized for release by: 6/4/2013 3:31:56 PM

Sheila Hoffman, Project Manager I sheila hoffman@testamericainc.com

·····LINKS ······

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Have a Question?



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Sample Summary

Client: Environmental Monitoring, Inc.

Project/Site: 95.97

TestAmerica Job ID: 680-90531-5

Lab Cample ID	Client Semple ID	Matrix	Collected	Received
Lab Sample ID	Client Sample ID	WIGHTIX	Collected	Received
680-90531-15	1325819	Water	05/16/13 08:25	05/21/13 10:15
680-90531-16	1325820	Water	05/16/13 09:15	05/21/13 10:15
680-90531-17	1325821	Water	05/16/13 10:00	05/21/13 10:15
680-90531-18	1325822	Water	05/16/13 10:30	05/21/13 10:15
680-90531-19	1325823	Water	05/16/13 11:10	05/21/13 10:15
680-90531-20	1325824	Water	05/16/13 12:15	05/21/13 10:15

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Method Summary

Client: Environmental Monitoring, Inc.

Project/Site: 95.97

TestAmerica Job ID: 680-90531-5

Method	Method Description	Protocol	Laboratory
335.4	Cyanide, Total	MCAWW	TAL SAV
420.1	Phenolics, Total Recoverable	MCAWW	TAL SAV
SM 5310B	Organic Carbon, Dissolved (DOC)	SM	TAL SAV

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions. SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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Definitions/Glossary

Client: Environmental Monitoring, Inc.

Reporting Limit or Requested Limit (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Relative Percent Difference, a measure of the relative difference between two points

Project/Site: 95.97

TestAmerica Job ID: 680-90531-5

Qualifiers

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

RL RPD

TEF

TEQ

Abbreviation	These commonly used abbreviations may or may not be present in this report.
а	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio

Client: Environmental Monitoring, Inc. Project/Site: 95.97

Client Sample ID: 1325819 -1199.01 - BCPT1

Lab Sample ID: 680-90531-15

Date Collected: 05/16/13 08:25 Date Received: 05/21/13 10:15

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.0025	U	0.010	0.0025	mg/L		05/28/13 10:00	05/28/13 14:39	1
Phenolics, Total Recoverable	0.025	U	0.050	0.025	mg/L		06/03/13 08:32	06/03/13 12:16	1
General Chemistry - Dissolved	Pocult	Qualifier	DI	MDI	Unit	n	Propared	Analyzod	Dil Fac
	Analyte Cyanide, Total Phenolics, Total Recoverable	Analyte Result Cyanide, Total 0.0025 Phenolics, Total Recoverable 0.025 General Chemistry - Dissolved	Analyte Result Qualifier Cyanide, Total 0.0025 U Phenolics, Total Recoverable 0.025 U General Chemistry - Dissolved	Analyte Result Cyanifier Qualifier RL Cyanide, Total 0.0025 U 0.010 Phenolics, Total Recoverable 0.025 U 0.050 General Chemistry - Dissolved	Analyte Result Cyanide, Total Qualifier RL MDL Cyanide, Total 0.0025 U 0.010 0.0025 Phenolics, Total Recoverable 0.025 U 0.050 0.025 General Chemistry - Dissolved	Analyte Result Cyanide, Total Qualifier RL O.0025 MDL Unit Unit Unit Unit Unit Unit Unit Unit	Analyte Result Cyanide, Total Qualifier RL O.0025 MDL Unit Unit Unit Unit Unit Unit Unit Unit	Analyte Result Cyanide, Total Qualifier RL O.010 MDL O.025 Unit Unit Unit Unit Unit Unit Unit Unit	Analyte Result Cyanide, Total Qualifier RL O.010 MDL O.0025 Mg/L Unit O.05/28/13 10:00 Prepared O.05/28/13 10:00 Analyzed O.05/28/13 14:39 Phenolics, Total Recoverable 0.025 U 0.050 0.025 Mg/L 06/03/13 08:32 06/03/13 12:16 General Chemistry - Dissolved

0.50 mg/L

Client Sample ID: 1325820 -1199.01 - BRFK4

Lab Sample ID: 680-90531-16

06/02/13 21:33

Date Collected: 05/16/13 09:15

Dissolved Organic Carbon

Matrix: Water

Matrix: Water

Date Received: 05/21/13 10:15

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.0025	U	0.010	0.0025	mg/L		05/28/13 10:00	05/28/13 14:40	1
Phenolics, Total Recoverable	0.025	U	0.050	0.025	mg/L		06/03/13 08:32	06/03/13 12:16	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.97	J	1.0	0.50	mg/L			06/02/13 21:47	1

Client Sample ID: 1325821 -1199.01 - BRFK3

Lab Sample ID: 680-90531-17

Matrix: Water

Date Collected: 05/16/13 10:00

Date Received: 05/21/13 10:15

General Chemistry Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.0025	U	0.010	0.0025	mg/L		05/28/13 10:00	05/28/13 14:41	1
Phenolics, Total Recoverable	0.025	U	0.050	0.025	mg/L		06/03/13 08:32	06/03/13 12:16	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0		1.0	0.50	mg/L			06/02/13 22:02	1

Client Sample ID: 1325822 -1199.01 - BRFK2

Lab Sample ID: 680-90531-18

Matrix: Water

Date Collected: 05/16/13 10:30

Date Received: 05/21/13 10:15

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.0025	U	0.010	0.0025	mg/L		05/28/13 10:00	05/28/13 14:42	1
Phenolics, Total Recoverable	0.025	U	0.050	0.025	mg/L		06/03/13 08:32	06/03/13 12:16	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.1		1.0	0.50	mg/L			06/02/13 22:16	1

TestAmerica Savannah

Client Sample Results

Client: Environmental Monitoring, Inc.

Project/Site: 95.97

TestAmerica Job ID: 680-90531-5

Lab Sample ID: 680-90531-19

Matrix: Water

Client Sample ID: 1325823 -1199.01 -	BRFK1
Date Collected: 05/16/13 11:10	

Date Received: 05/21/13 10:15

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.0025	U	0.010	0.0025	mg/L		05/28/13 10:00	05/28/13 14:43	1
Phenolics, Total Recoverable	0.025	U	0.050	0.025	mg/L		06/03/13 08:32	06/03/13 12:16	1
-									

General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	כ	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.86	J	1.0	0.50	mg/L			06/02/13 22:31	1

Client Sample ID: 1325824 -1199.01 - BPR1 Lab Sample ID: 680-90531-20

Date Collected: 05/16/13 12:15 Matrix: Water

Date Received: 05/21/13 10:15

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.0025	U	0.010	0.0025	mg/L		05/28/13 10:00	05/28/13 14:45	1
Phenolics, Total Recoverable	0.031	J	0.050	0.025	mg/L		06/03/13 08:32	06/03/13 12:16	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0		1.0	0.50	mg/L			06/02/13 22:45	1

Client Sample ID: Method Blank

Client: Environmental Monitoring, Inc.

Project/Site: 95.97

Method: 335.4 - Cyanide, Total

Lab Sample ID: MB 680-278137/1-A

Matrix: Water

Analysis Batch: 278209

Prep Type: Total/NA Prep Batch: 278137

мв мв

RL MDL Unit Analyte Result Qualifier D Prepared Dil Fac Analyzed 0.010 0.0025 mg/L 05/28/13 10:00 05/28/13 14:15 Cyanide, Total 0.0025 U

Lab Sample ID: LCS 680-278137/2-A

Matrix: Water

Analyte

Cyanide, Total

Analysis Batch: 278209

Spike Added

RL

RI

1.0

0.050

0.0500

Spike

Added

0.248

Spike

Added

20.0

20.0

20.0

20.0

LCS LCS Result Qualifier 0.0510

MDL Unit

0.025 mg/L

LCS LCS

0.192

Result Qualifier

MDL Unit

0.50 mg/L

LCS LCS

18.9

18.9

18.9

18.9

Result Qualifier

Unit

mg/L

Unit

mg/L

mg/L

mg/L

mg/L

Unit mg/L

%Rec 102

Prepared

06/03/13 08:32

%Rec

Prepared

94

94

95

D

D

Limits 90 - 110

Client Sample ID: Lab Control Sample

Method: 420.1 - Phenolics, Total Recoverable

Lab Sample ID: MB 680-278826/1-A

Matrix: Water

Analysis Batch: 278887

MR MR

0.50 U

Analyte

Result Qualifier Phenolics, Total Recoverable 0.025 U

Lab Sample ID: LCS 680-278826/2-A

Matrix: Water Analysis Batch: 278887

Phenolics, Total Recoverable

Analyte

Method: SM 5310B - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 680-278934/4

Matrix: Water

Analysis Batch: 278934

MB MB Result Qualifier

Analyte Dissolved Organic Carbon

Lab Sample ID: LCS 680-278934/5

Matrix: Water

Analysis Batch: 278934

Dissolved Organic Carbon DOC Result 3 DOC Result 2 DOC Result 1

Client Sample ID: Method Blank Prep Type: Total/NA

06/03/13 12:16

Prep Batch: 278826

Prep Type: Total/NA

Prep Batch: 278137

Analyzed Dil Fac

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 278826

%Rec. Limits 75 - 125

Client Sample ID: Method Blank

Prep Type: Dissolved

Analyzed

06/02/13 15:59

Client Sample ID: Lab Control Sample **Prep Type: Dissolved**

80 - 120

80 - 120

80 - 120

%Rec. %Rec Limits 94 80 - 120

TestAmerica Savannah

6/4/2013

Dil Fac

TestAmerica Job ID: 680-90531-5

Client: Environmental Monitoring, Inc.

Project/Site: 95.97

General Chemistry

Prep Batch: 278137

Client Sample ID	Prep Type	Matrix	Method	Prep Batch
1325819	Total/NA	Water	Distill/CN	
1325820	Total/NA	Water	Distill/CN	
1325821	Total/NA	Water	Distill/CN	
1325822	Total/NA	Water	Distill/CN	
1325823	Total/NA	Water	Distill/CN	
1325824	Total/NA	Water	Distill/CN	
Lab Control Sample	Total/NA	Water	Distill/CN	
Method Blank	Total/NA	Water	Distill/CN	
	1325819 1325820 1325821 1325822 1325823 1325824 Lab Control Sample	1325819 Total/NA 1325820 Total/NA 1325821 Total/NA 1325822 Total/NA 1325823 Total/NA 1325824 Total/NA Lab Control Sample Total/NA	1325819 Total/NA Water 1325820 Total/NA Water 1325821 Total/NA Water 1325822 Total/NA Water 1325823 Total/NA Water 1325824 Total/NA Water Lab Control Sample Total/NA Water	Total/NA Water Distill/CN

Analysis Batch: 278209

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-90531-15	1325819	Total/NA	Water	335.4	278137
680-90531-16	1325820	Total/NA	Water	335.4	278137
680-90531-17	1325821	Total/NA	Water	335.4	278137
680-90531-18	1325822	Total/NA	Water	335.4	278137
680-90531-19	1325823	Total/NA	Water	335.4	278137
680-90531-20	1325824	Total/NA	Water	335.4	278137
LCS 680-278137/2-A	Lab Control Sample	Total/NA	Water	335.4	278137
MB 680-278137/1-A	Method Blank	Total/NA	Water	335.4	278137

Prep Batch: 278826

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-90531-15	1325819	Total/NA	Water	Distill/Phenol	
680-90531-16	1325820	Total/NA	Water	Distill/Phenol	
680-90531-17	1325821	Total/NA	Water	Distill/Phenol	
680-90531-18	1325822	Total/NA	Water	Distill/Phenol	
680-90531-19	1325823	Total/NA	Water	Distill/Phenol	
680-90531-20	1325824	Total/NA	Water	Distill/Phenol	
LCS 680-278826/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 680-278826/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 278887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-90531-15	1325819	Total/NA	Water	420.1	278826
680-90531-16	1325820	Total/NA	Water	420.1	278826
680-90531-17	1325821	Total/NA	Water	420.1	278826
680-90531-18	1325822	Total/NA	Water	420.1	278826
680-90531-19	1325823	Total/NA	Water	420.1	278826
680-90531-20	1325824	Total/NA	Water	420.1	278826
LCS 680-278826/2-A	Lab Control Sample	Total/NA	Water	420.1	278826
MB 680-278826/1-A	Method Blank	Total/NA	Water	420.1	278826

Analysis Batch: 278934

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-90531-15	1325819	Dissolved	Water	SM 5310B	
680-90531-16	1325820	Dissolved	Water	SM 5310B	
680-90531-17	1325821	Dissolved	Water	SM 5310B	
680-90531-18	1325822	Dissolved	Water	SM 5310B	
680-90531-19	1325823	Dissolved	Water	SM 5310B	
680-90531-20	1325824	Dissolved	Water	SM 5310B	
LCS 680-278934/5	Lab Control Sample	Dissolved	Water	SM 5310B	

TestAmerica Savannah

Page 8 of 14

QC Association Summary

 ${\bf Client: Environmental\ Monitoring,\ Inc.}$

Project/Site: 95.97

TestAmerica Job ID: 680-90531-5

General Chemistry (Continued)

Analysis Batch: 278934 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-278934/4	Method Blank	Dissolved	Water	SM 5310B	

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Client: Environmental Monitoring, Inc.

Project/Site: 95.97

Client Sample ID: 1325819 Lab Sample ID: 680-90531-15 Date Collected: 05/16/13 08:25

Matrix: Water

Date Received: 05/21/13 10:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/CN			278137	05/28/13 10:00	DAM	TAL SAV
Total/NA	Analysis	335.4		1	278209	05/28/13 14:39	DAM	TAL SAV
Total/NA	Prep	Distill/Phenol			278826	06/03/13 08:32	TF	TAL SAV
Total/NA	Analysis	420.1		1	278887	06/03/13 12:16	TF	TAL SAV
Dissolved	Analysis	SM 5310B		1	278934	06/02/13 21:33	JR	TAL SAV

Client Sample ID: 1325820 Lab Sample ID: 680-90531-16

Matrix: Water

Date Collected: 05/16/13 09:15

Date Received: 05/21/13 10:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/CN			278137	05/28/13 10:00	DAM	TAL SAV
Total/NA	Analysis	335.4		1	278209	05/28/13 14:40	DAM	TAL SAV
Total/NA	Prep	Distill/Phenol			278826	06/03/13 08:32	TF	TAL SAV
Total/NA	Analysis	420.1		1	278887	06/03/13 12:16	TF	TAL SAV
Dissolved	Analysis	SM 5310B		1	278934	06/02/13 21:47	JR	TAL SAV

Client Sample ID: 1325821 Lab Sample ID: 680-90531-17

Date Collected: 05/16/13 10:00 **Matrix: Water**

Date Received: 05/21/13 10:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/CN			278137	05/28/13 10:00	DAM	TAL SAV
Total/NA	Analysis	335.4		1	278209	05/28/13 14:41	DAM	TAL SAV
Total/NA	Prep	Distill/Phenol			278826	06/03/13 08:32	TF	TAL SAV
Total/NA	Analysis	420.1		1	278887	06/03/13 12:16	TF	TAL SAV
Dissolved	Analysis	SM 5310B		1	278934	06/02/13 22:02	JR	TAL SAV

Client Sample ID: 1325822 Lab Sample ID: 680-90531-18

Date Collected: 05/16/13 10:30 **Matrix: Water**

Date Received: 05/21/13 10:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/CN			278137	05/28/13 10:00	DAM	TAL SAV
Total/NA	Analysis	335.4		1	278209	05/28/13 14:42	DAM	TAL SAV
Total/NA	Prep	Distill/Phenol			278826	06/03/13 08:32	TF	TAL SAV
Total/NA	Analysis	420.1		1	278887	06/03/13 12:16	TF	TAL SAV
Dissolved	Analysis	SM 5310B		1	278934	06/02/13 22:16	JR	TAL SAV

TestAmerica Savannah

Lab Chronicle

Client: Environmental Monitoring, Inc.

Project/Site: 95.97

TestAmerica Job ID: 680-90531-5

Lab Sample ID: 680-90531-19

Matrix: Water

Client Sample ID: 1325823
Date Collected: 05/16/13 11:10
Date Received: 05/21/13 10:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/CN			278137	05/28/13 10:00	DAM	TAL SAV
Total/NA	Analysis	335.4		1	278209	05/28/13 14:43	DAM	TAL SAV
Total/NA	Prep	Distill/Phenol			278826	06/03/13 08:32	TF	TAL SAV
Total/NA	Analysis	420.1		1	278887	06/03/13 12:16	TF	TAL SAV
Dissolved	Analysis	SM 5310B		1	278934	06/02/13 22:31	JR	TAL SAV

Client Sample ID: 1325824 Lab Sample ID: 680-90531-20

Date Collected: 05/16/13 12:15 Matrix: Water

Date Received: 05/21/13 10:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/CN			278137	05/28/13 10:00	DAM	TAL SAV
Total/NA	Analysis	335.4		1	278209	05/28/13 14:45	DAM	TAL SAV
Total/NA	Prep	Distill/Phenol			278826	06/03/13 08:32	TF	TAL SAV
Total/NA	Analysis	420.1		1	278887	06/03/13 12:16	TF	TAL SAV
Dissolved	Analysis	SM 5310B		1	278934	06/02/13 22:45	JR	TAL SAV

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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Log Sheet i of !



SAMPLE LOG SHEET & CHAIN OF CUSTODY

*PARAMETER (ANALYSIS REQUESTED)	ENVIRONMENTAL CONSULTANTS A ANALYTICAL LABORATORIES P.O. Box 1190 A Norton, Virginia 24273 A 276-679-6544 *CONTACT:	ENVIRONMENTAL MONITORING, INCORPORATED *CLIENT: Red River Coal Company, Inc. Address:	CUSTOMER INFORMATION: Shaded Areas • LAB INFORMATION: White Areas
STATECTION			RMATION: White Areas

PH Meter #_	METHOD OF	*Relinquished by (sign)	Relinquished by (sign)	Hazard Inf		9						μ.			EMI No.	*EMI PROJECT NO.:	CLIENT PROJ. NO.	*SITE ID:	Additional Co	TURN-ARO	COLLECTED BY (print)	•
	WETHOD OF SHIPMENT TO LAB (circle)	by (sign)	Toy (sign)	Hazard Information: (circle)					oc .	×	×.	××	ox.	618SEE.	EMI SAMPLE #	0		0911011	Additional Cost May Apply – Any TAT Not Specified Will Be Regula	TURN-AROUND (circle):	COLLECTED BY (print) COLLECTOR(S) SIGNATURE(S)	
	AB (circle) C EMI-DIRECT	*Date/Time	10 10 10 10 10 10 10 10 10 10 10 10 10 1						511/hes	833/119	822/1199	11/188	880/119	~		297	10.991	0	- Any TAT Not	2 Day (Working Days)	RE(S) Journes	+
BIN #		*Received By (sign)		azard					1199-01-BPR1	1199-01-BRFK1	1199-01- BRFK2	1199-01-BRFK3	1199.01-BRFK4	1199:01 - BCPT	CUSTOMER SAMPLE	アンプ	EMI PROJECT		Specified Will	3 Day (Working Days)	or Breeding	
e	EMI PICKUP (PERSONAL DELIVERY)	By (sign)	ay (sign)	Flammable					1							0	JECT		Be Regular	5 Day (Working Days)	I has	
	AL DELIVERY	Ro	William To	S					5-16-13	5-16-13	5-16-13	5-16-13	5-16-13	5-16-13	COLLECTED C	白み	Special I Requirema				doc	4
No. of Containers	OTHER	Relinquished by (sign)	Helinquished by (sign)	Skin Irritant					12:18	01:11	10:30	10:00	9:13	2:25	. TIME	Sampline	Special Instructions / QC Requirements & Comments			10 Day (Working Days) (Day	
ntainers	Ten	d igi	hillie	oison					AO	AQ	Po	AG	AO	AQ	MATRIX CN	وي	ments			Regular (15 Working Days)		
43	Temperature of Cooler upon Receipt by Lab	State/Time	\$\tag{\tag{\tag{\tag{\tag{\tag{\tag{	ינט -			-		7	7 ×	7	7	7	7	CNTRS. COG		П	mis	c. 5	ic Li	z †	Ī
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Login Sample Receipt Checklist

Client: Environmental Monitoring, Inc.

Job Number: 680-90531-5

Login Number: 90531 List Source: TestAmerica Savannah

List Number: 1

Creator: Conner, Keaton

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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TestAmerica Job ID: 680-90531-5

Client: Environmental Monitoring, Inc.

Project/Site: 95.97

Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date	
A2LA	DoD ELAP		399.01	07-31-13	
Alabama	State Program	4	41450	06-30-13	
Alaska (UST)	State Program	10	UST-104	06-19-13	
Arkansas DEQ	State Program	6	88-0692	02-01-13 *	
California	NELAP	9	3217CA	07-31-13	
Colorado	State Program	8	N/A	12-31-13	
Florida	NELAP	4	E87052	06-30-13	
GA Dept. of Agriculture	State Program	4	N/A	12-31-13	
Georgia	State Program	4	N/A	06-30-13	
Georgia	State Program	4	803	06-30-13	
Hawaii	State Program	9	N/A	06-30-13	
Illinois	NELAP	5	200022	11-30-13	
Indiana	State Program	5	N/A	06-30-13	
lowa	State Program	7	353	07-01-13 *	
Kentucky	State Program	4	90084	12-31-12 *	
Kentucky (UST)	State Program	4	18	03-31-13 *	
Louisiana	NELAP	6	30690	06-30-13	
Louisiana	NELAP	6	LA100015	12-31-13	
Maine	State Program	1	GA00006	08-16-14	
Maryland	State Program	3	250	12-31-13	
Massachusetts	State Program	1	M-GA006	06-30-13	
Michigan	State Program	5	9925	06-30-13	
Mississippi	State Program	4	N/A	06-30-13	
Montana	State Program	8	CERT0081	01-01-14	
Nebraska	State Program	7	TestAmerica-Savannah	06-30-13 *	
New Jersey	NELAP	2	GA769	06-30-13	
New Mexico	State Program	6	N/A	06-30-13	
New York	NELAP	2	10842	04-01-14	
North Carolina DENR	State Program	4	269	12-31-13	
North Carolina DHHS	State Program	4	13701	07-31-13	
Oklahoma	State Program	6	9984	08-31-13	
Pennsylvania	NELAP	3	68-00474	06-30-13 *	
Puerto Rico	State Program	2	GA00006	01-01-14	
South Carolina	State Program	4	98001	06-30-13	
Tennessee	State Program	4	TN02961	06-30-13	
Texas	NELAP	6	T104704185-08-TX	11-30-13	
USDA	Federal		SAV 3-04	04-07-14	
Virginia	NELAP	3	460161	06-14-13 *	
Washington	State Program	10	C1794	06-10-13	
West Virginia	State Program	3	9950C	12-31-13	
West Virginia DEP	State Program	3	94	06-30-13	
Wisconsin	State Program	5	999819810	08-31-13	
Wyoming	State Program		8TMS-Q	06-30-13	

TestAmerica Savannah

6/4/2013

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^{*} Expired certification is currently pending renewal and is considered valid.